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ABSTRACT

Intended for geography professors, students, and researchers, this publication explores some topics in the area of alcohol use and abuse that are potentially suited for geographical research. There are four chapters. Chapter 1 introduces some of the more familiar arguments for and against alcohol consumption. The second chapter deals with the cultural context in which drinking occurs and reviews some of the geographical variations in drinking practices, from both a global and a national perspective. Chapter 3 discusses why people drink heavily and what happens when they drink to excess. Also reviewed in this chapter are some attempts to estimate the spatial prevalence of alcoholism and other alcohol-related problems in the United States. The concluding chapter reviews some of the theories of alcohol use and abuse and examines options available for prevention and control. A bibliography concludes the publication. (RM)

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ALCOHOL ABUSE

Geographical Perspectives

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SP 015 000

RESOURCE PUBLICATIONS
IN GEOGRAPHY

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Cover: Unlike the accident illustrated, all too many tragedies are alcohol-related. Rear cover data from the Oklahoma City Alcohol Safety Action Project provides some guidance.

Foreword

It is unlikely that any geographer, in personal or professional life, will not witness the consequences of alcohol abuse. Annual costs of alcohol abuse and alcoholism in the United States approach 50 *billion* dollars. This economic value of lost production, health care, motor vehicle accidents, violent crime, fire losses, and societal responses hides the anguish felt by friends, colleagues, and family members when lives are destroyed by alcohol. Nearly one hundred thousand Americans will die this year as a direct or indirect result of alcohol abuse. Some 18 million Americans are heavy drinkers, almost six million of whom are alcoholics. There is no lack of recognition of alcohol abuse as a major social problem — the media, tougher drunk-driving laws, and government programs reflect our concern.

Geographers have not neglected alcohol in their research. The economic geography of alcohol reflects a $35 billion annual business in the U.S. Alcohol is a major product of the regional economy of nations (Scotland's whisky and France's wines) and a fascinating topic of study. We admire the cartographic excellence of the finest wine atlases, teach courses in the geography of wine, and envy the accomplished wine maker's and connoisseur's cellars. Professional field trips follow well-trodden tourist paths to the Napa or Spey Valleys. Researchers abroad enjoy, if not report, some of the limitless local varieties of alcoholic beverages whose ubiquity is indicated by the Gaelic phrase, *uisge beatha*, water of life.

It is surprising that so little of the geographer's fascination with alcohol has been directed to the harmful effects of a substance we too often treat as benign if not healthful. In this volume, *Alcohol Abuse*, Christopher Smith and Robert Hanham provide an introduction to the geography of the *consequences* of excessive alcohol use. Their discussion is disquieting; at the same time it is challenging. Bad news is always uncomfortable, and this book brings sad tidings in two ways — it attests to the social costs of alcohol *and* to the paucity of geographical contributions to alcohol as a problem. However, contemporary geographical perspectives and research *can* contribute to understanding a major paradox of modern society — a society lubricated by the conviviality of a 'drink' but aghast at the consequences of alcohol abuse.

Many of the traditional labels in geography do not fit a study of this kind — it is neither medical geography, social geography, human geography, nor economic geography. Rather, it is all of them — an insightful synthesis of ideas and analyses from geography and other disciplines, set in an international context, and brought together for professional colleagues and students.

Resource Publications in Geography are monographs sponsored by the Association of American Geographers, a professional organization whose purpose is to advance studies in geography and to encourage the application of geographic research in education, government, and business. The series brings contemporary research in the various fields of geography to the attention of students and senior geographers, as well as to researchers in related fields. The ideas presented, of course, are the authors' and do not imply AAG endorsement.

The editor and advisory board want this volume, the third in the 1982 series, to make all of us more aware of the consequences of alcohol abuse and of how geographers might contribute toward understanding and ameliorating the problem.

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Preface and Acknowledgements

Alcohol is a commodity bought and sold in the marketplace and consumed according to spatially variant cultural practices. When used to excess, alcohol creates serious health problems. Alcohol abuse is a topic that should be of interest to geographers, particularly those who favor economic, cultural, or medical geography. At the present time, geographic interest is still dormant, with the exception of some isolated studies. Here we will explore some topics in the area of alcohol use and abuse that are potentially ripe for geographical research. Some of the work we describe has already been conducted, although largely by non-geographers. We have done some initial studies in our own empirical research, and some of our results are presented. Still other directions seem challenging, but at this time they remain at the level of hypothesis and speculation.

To organize our exploration, chapters are grouped according to alcohol-related topics rather than by geographical concepts. We begin with a general introduction, looking briefly at alcohol use, its effects, and how attitudes toward it have changed through time. In Chapter 1 we introduce some of the more familiar arguments for and against alcohol consumption. In Chapter 2 we deal with the cultural context in which drinking occurs and review some of the geographical variations in drinking practices, from both a global and a national (United States) perspective. In Chapter 3 we tackle the question of why people drink heavily, and what happens when they drink to excess, particularly when heavy drinking contradicts local norms for alcohol consumption. In this chapter we also review some attempts to estimate the spatial prevalence of alcoholism and other alcohol-related problems in the United States. In Chapter 4 we review some of the theories of alcohol use and abuse, and we examine some of the options available for prevention and control.

As we move through these different steps we touch on some of the major methodological themes within the discipline of geography. For example, in the *regional* tradition we attempt to delineate drinking regions, based either on alcohol consumption data or the prevalence of alcohol-related problems. A second perspective, usually appended to the first, involves the *sociological-ecological* tradition in geography, which in this case includes attempts to explain spatial variations in drinking and problem drinking in terms of sociological variables. In the tradition of *spatial analysis* we have also found isolated attempts to investigate patterns of alcohol use and abuse in relation to some of the abstract dimensions of space, including distance, clustering, scale, and accessibility. Whenever possible we have also tried to draw out the economic and political consequences of alcohol abuse. We hope that our work will help in some small way to focus attention on what is one of the major social problems of our time. As we shall demonstrate, theoretical thinking in the field of alcohol abuse is eclectic, but alcohol policy and treatment strategies are still largely determined by vested economic interests, including those of the medical profession. As the study of alcohol abuse spreads further into the realm of social science, we feel relatively optimistic that some real progress can be made toward the prevention of alcoholism.

We thank Henry Malin at the National Institute on Alcohol Abuse and Alcoholism (NIAAA) for making data available to us; Deborah Morse for the illustrations; and Jean Gallaher for typing the manuscript.

Christopher J. Smith
Robert Q. Hanham

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1

The Uses and Abuses of Alcohol

The huntsman he can't hunt the fox
Nor so loudly blow his horn;
And the tinker he can't mend kettle nor pot
Without a little barleycorn.
John Barleycorn (traditional)

Alcohol is produced by fermentation, a process in which sugar is converted to ethanol. The conversion involves naturally occurring yeast, so it was probably by accident, long ago, that someone realized drinking spoiled fruit juices or eating malted cereals produced a pleasant effect. People quicky learned how to speed up the natural process of fermentation by adding yeast, and over the years they were also able to improve the taste and change the color with locally available fruits and vegetables. For centuries different regions of the world have made their own brand of alcoholic beverage from whatever food they had in surplus (Smuckler 1975).

Beer and wine were produced in small quantities in most Stone Age societies (Anderson 1967), but distilled spirits were not discovered until the 9th century, when a Moslem alchemist noticed that the steam from heated wine had a higher alcohol content than the original liquid (Roueche 1960). By condensing the steam a more potent brew was produced — hence the word 'alcohol,' which, roughly translated, means 'a finely divided spirit' (S. Shaw *et al.* 1978). Beers usually range from 3-6% alcohol by volume; table wines, 10-12%; fortified wines, 16-22%. Liquors and spirits are usually at least 30-40% alcohol and often higher. Differences in strength probably account for some of the persistent myths about drinking, for example, that beer is 'safer' to drink than spirits. In fact, beer contains as much alcohol, drink for drink, as whiskey, because it is often consumed in larger units. However, the low concentration of alcohol probably saves many lives, because it ensures that without a superhuman effort it is almost impossible to take a fatal dose at one sitting.

Alcohol in the United States

When we use the verb 'to drink,' in most cases alcohol is the beverage implied, demonstrating the ubiquity of alcohol consumption in our culture. For centuries people have been eager to drink alcohol to experience its acute pharmacological effects. But, as consumption has increased through the years, public attitudes toward alcohol have diverged. Alcohol has been attacked in all parts of the world because of its direct effects on human behavior and its indirect costs to society. Alcohol survives in most cultures, but its survival has been achieved only at a considerable cost. Forces of prohibition

have failed to remove alcohol from the landscape, but they have managed to limit the sale and use of alcoholic beverages. Because each state in the United States establishes its own laws to govern the availability of alcohol, the net effect is a hodge-podge of often contradictory regulations. Where alcohol is not easily available it may become a more prized possession, bought in larger quantities, and consumed more rapidly or secretly. As we shall see later, there is evidence to suggest that alcohol-related problems are *greater* in the 'drier' states where alcohol is *less* available than in 'wetter' states. Ambiguities in statewide differences in alcohol laws are matched by ambiguities in public attitudes toward heavy drinkers and alcoholics. In many Western societies a persistently duality exists. As Morris Chafetz (1979:296), the first director of the National Institute on Alcohol Abuse and Alcoholism (NIAAA), has observed:

> *Drinking is approved, even encouraged, as an escape from problems, a relaxing technique, and as a source of entertainment. . . . But this approving attitude suddenly turns to rejection when the drinker has drunk too much . . .*

The existence of a double standard was empirically demonstrated in a recent British survey (G. Shaw *et al.* 1978). Only 5% of the respondents said they disapproved of people having a drink, but 78% disapproved of drunkenness — even though one in four of the respondents admitted they had been drunk at least once in the twelve months before the survey.

In the United States attitudes toward alcohol have altered substantially over the last two centuries. In the 17th and 18th centuries, it was commonly assumed that people who drank excessively did so *because they wanted to.* Habitual drunkenness was thought to be neither physically damaging nor psychologically addicting — it was simply a matter of choice. Alcohol flowed freely at all social functions. The tavern was a key local institution, in fact it was often the center of social and political life. Americans drank with gay abandon. One observer of the period referred to the country as the 'alcoholic republic' (Rorabaugh 1979). Some more pious clerical leaders publicly chastised drunkards as sinners, but the majority view was that drunkenness was something people could control. By the start of the 19th century a different view was becoming popular: that drunkards experienced an uncontrollable urge for alcohol (Levine 1978). Dr. Benjamin Rush and a few other physicians were beginning to outline a new concept of *alcohol addiction,* which was thought to be a gradual and progressive disease. Rush (1814) identified alcohol as the causal agent at the root of the addiction, and he advocated complete abstinence as the only solution. The Temperance Movement subsequently claimed Rush as its founder. As the Movement grew to half-a-million-strong by 1830, the abstinence principle was reinforced daily by the increasing public presence of hopelessly-out-of-control drunkards (Clark 1976).

In some ways, public pronouncements of the early Temperance Movement were similar to the post-Prohibition views on alcoholism that were to become the basis of Alcoholics Anonymous in the 20th century. Many Temperance leaders were sympathetic toward chronic inebriates, attributing their affliction to a disease that was not their fault. It was only in the 1890s that Temperance ideology shifted from this broad reformist orientation to a single-minded fetish about Prohibition. Levine (1978) argued that in this period the predominant view of alcohol changed from an addicting to an evil substance. The corresponding view of the drunkard also changed from a sympathetic attitude to that of a public nuisance. As a result of the fervor and longevity of the

Prohibition movement, the 'rediscovery' of alcoholism as an addiction and a disease was delayed until the birth of Alcoholics Anonymous in the 1930s.

To ensure that the public would accept the idea of alcoholism as a disease, it was necessary to cast aside the prevailing Temperance view of alcohol as an inherently addictive substance. Alcoholics Anonymous (AA) offered a viable alternative view — that *alcohol was only addictive to some people*, for reasons that were still unknown. This allowed a response to drinking problems that blamed neither the alcohol nor the individual drinker. AA was offering a concept of alcoholism that could be clearly differentiated from the moralistic sentiments of the Temperance Movement, from the Prohibitionist view that alcohol should be banned completely, and from the unscientific and still not-quite-respectable views of the public health movement. The AA theory of alcoholism was quasi-scientific and medical. As we shall see, this theory enabled the alcoholic to enjoy both the sympathy of the public and the benefits of modern medicine. Alcoholism was now thought of as a disease, but not a self-inflicted disease. The solution was still complete abstinence, just as it had been during the Temperance Movement, but abstinence was now an individual rather than a social goal (Beauchamp 1980).

In recent years 'post-addiction' models of alcoholism have become fashionable, with a focus on the relationships between individuals and their social environments (NIAAA 1981a). This view represents yet another shift in attitudes toward alcohol, this time away from specific person/drug interactions toward a wider sociological or ecological perspective. This new position will probably have to compete for many years with the addiction viewpoint, just as that position had competed with its predecessors.

This brief overview of attitudes toward alcoholism in the United States illustrates how public and professional views have shifted backwards and forwards through time. As attitudes have changed, so too have the regulations governing the availability and consumption of alcohol. Temporal variations are complemented by spatial variations (Table 1). As we might expect, in areas where the prevailing attitudes toward alcohol have been permissive, the existing laws generally reflect permissiveness, and vice-versa. This is true at the state level (Figure 1) and also at the community level (Table 2). A journey across the United States today reflects some of the ambiguities in public attitudes toward alcohol. In some states, drinkers have almost unlimited access to alcohol; in others, the sale of alcohol is rigidly controlled:

> *In one location an individual can freely purchase what he wants whereas in another he has to provide his name and address or own a permit. In some states, he can purchase five bottles but not six. Sometimes he can buy a bottle of whiskey but not a single drink (Ewing and Rouse 1978b:30).*

Geographical variations in attitudes toward alcohol have been one source of regional tension within the United States during the last two centuries. Gusfield (1966), for example, argued that the Temperance Movement can be understood as a 'symbolic crusade' by the inhabitants of certain regions, notably the Great Plains and the South, to impose their views on the inhabitants of other regions. This regional tension has also been fueled by another source of spatial conflict, that between the rural areas and the towns of America. Temperance groups have always been strongest in rural areas. To a large extent they associate alcoholism with urbanization and with the decline in traditional morality encouraged by city living (Howland and Howland 1978).

TABLE 1 REGIONAL DIFFERENCES IN ADULT DRINKING PATTERNS AND SENTIMENTS

Region	% Abstainers	% Heavy Drinkers	Per Capita Consumption[a]		Sentiments (%) "Nothing Good About Drinking"	Sentiments (%) Against Repeal
	1964	1964	1940	1966	1964	1932
Dry Regions						
South Atlantic	42	7	1.11	2.42	41	35
East South Central	65	4	0.57	1.50	61	41
West South Central	38	6	0.88	2.08	36	38
West North Central	34	6	1.22	2.16	41	33
Mountain	42	8	1.33	2.54	41	30
Wet Regions						
New England	21	13	1.72	2.94	29	22
Middle Atlantic	17	16	1.78	2.75	34	19
East North Central	25	12	1.75	2.58	31	24
Pacific	27	12	1.87	2.98	26	24

[a]Gallons of absolute alcohol (population aged 15 and over).
Source: Cahalan and Room 1974:80. Reprinted by permission from Journal of Studies on Alcohol, Inc.

Attitudes toward alcohol in the United States are ambivalent, and alcohol laws are ambiguous. Although alcohol is usually easily available, members of the public still think of drinking as a taboo subject. Survey researchers observe that their respondents often deny that they drink; serious under-reporting is commonplace. In a recent nationwide study, for example, the average consumption of pure alcohol by Americans was .30 ounces per day, slightly less than a third of a drink per person. The actual consumption data, based on alcohol sales, indicate that the daily average consumption is more than three times higher — .95 ounces per person (Malin *et al.* 1980).

The Effects of Alcohol

Alcoholic drinks contain ethanol, or ethyl alcohol, and one or more congenors. The ethanol produces the desired psychic and physical effects, while the congenors provide the taste and smell unique to a particular drink. About 20% of an alcoholic beverage is absorbed directly into the blood from the stomach, which explains why many novice drinkers feel slightly intoxicated after drinking only a small amount. The rest of the alcohol goes through the pyloric valve to the small intestine, where it is absorbed into the blood without being digested. In general, the absorption rate is rapid and maximum blood alcohol levels are reached one to one-and-a-half hours after drinking. On average, a single shot of whiskey, a glass of wine, or a bottle of beer will raise the blood alcohol level to 15 milligrams of alcohol per 100 milliliters (<0.02% blood alcohol). Once it is in the blood, alcohol is eliminated slowly, which explains why a peak blood alcohol level is maintained long after the drinking stops. About 5% of the alcohol is excreted in the urine and the breath, and the rest is oxidized, mainly in the liver.

Ethanol reacts with oxygen in the blood and is broken down to a highly toxic substance known as acetaldehyde. This process occurs at a constant rate, and in an average person the blood alcohol level is reduced by about 15 milligrams per 100 milliliters of blood per hour. At this rate a person with a blood alcohol level of .03% (convivial drinking) will have no alcohol in his or her blood after two hours. The absorption rate varies from person to person depending on body weight, and the presence or absence of food, which delays the passage of alcohol into the small intestine. Fortunately for most drinkers, acetaldhyde is oxidized quickly in the liver and converted to acetate, or vinegar, which is subsequently reduced to carbon dioxide and water at various locations throughout the body (Goldberg 1977). In this final stage, energy is liberated, mostly in the muscles. The energy derived from alcohol is approximately seven calories per gram, which is greater by volume than the energy from equivalent amounts of protein or carbohydrate. On the other hand, alcohol is a poor source of food because it contains no proteins, fats, or vitamins (Brody 1981; S. Shaw *et al.* 1978).

The most immediate effect of alcohol is on the central nervous system. In general, the degree of intoxication is related to the level of alcohol in the blood and the speed of ingestion, although psychological and social factors appear to produce substantial individual differences. At low dosages, alcohol is a mild stimulant, but changes in feeling and behavior actually result from the depressant effects on the brain centers that

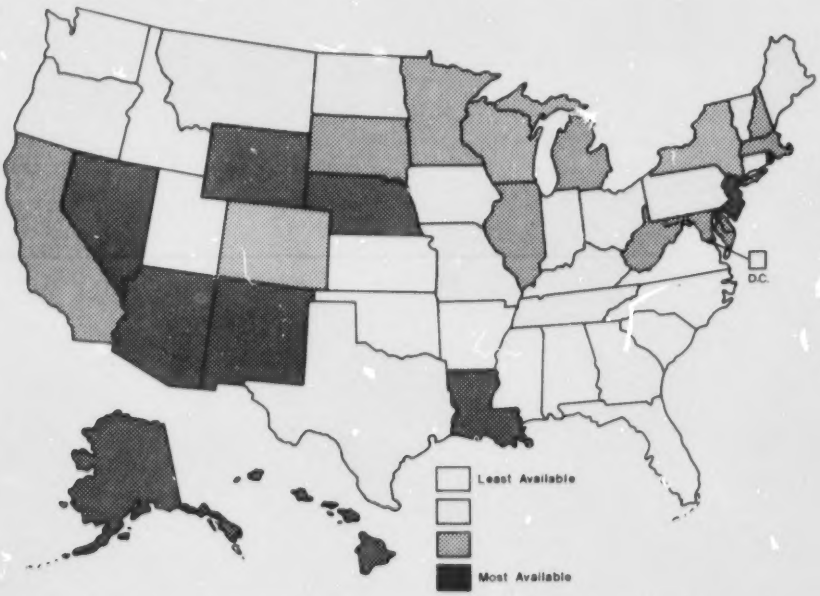

FIGURE 1 ALCOHOL AVAILABILITY IN THE UNITED STATES. The map illustrates different levels of availability in each state, based on an index described by Smart (1980) and a report produced by Medicine in the Public Interest (1979). The index is constructed from state to state variations in a number of Alcoholic Beverage Control laws.

TABLE 2 DRINKING LEVEL AND LOCAL ALCOHOL AVAILABILITY (percentages)

Locality Type	Total Number	Abstainers	Infrequent Drinkers	Light and Moderate Drinkers	Heavy Drinkers	% Heavy of all Drinkers
WET (Local community permits sale of both beer and spirits)	2442	28	15	44	13	18
DRY (Local community prohibits sale of spirits and sometimes beer; both are available elsewhere in the county)	100	49	8	35	8	16
DRIEST (Local community and county prohibits sale of spirits and beer; only available in adjacent counties and states)	204	65	11	18	6	17
TOTAL SAMPLE	2746	32	15	41	12	18

Source: Cahalan, *et al.* 1969:39. Reprinted by permission from Journal of Studies on Alcohol, Inc.

control such processes. The drinker's inhibitions are loosened; he or she becomes more talkative, less self-conscious, and often less discrete. At higher dosages thoughts and abilities are impared. If drinking continues, the individual may experience a blackout; at extremely high dosages, death is inevitable.

Individuals who drink continually often develop a *tolerance* for alcohol, which means they need increasing amounts to produce the same effects. In one study, for example, alcoholics drank 30 ounces of whiskey daily, a near-lethal dose to a moderate drinker, with no overt signs of intoxication (Mello and Mendelson 1970). In the final stages of alcoholism, it may only take one or two drinks for a person to become drunk, which indicates that tolerance has a curve that is an inverted 'u' in shape. Although this is a controversial issue, it seems likely that tolerance is a process of adaptation that is partly physical and partly psychological. By being able to 'hold' his drink, a heavy consumer can keep his job and fulfill most of his normal daily duties. The existing research shows that tolerance develops rapidly, particularly in young adults. Although tolerance fades equally rapidly with abstinence, it is quickly re-acquired. Alcoholics who start drinking again after a spell 'on the wagon' report that each time they do so, their tolerance appears to return quicker than before (G. K. Shaw 1979).

A person is considered to be *dependent* on alcohol if his thoughts are dominated by alcohol and his behavior is dominated by drinking (Davies 1979). Dependence is also likely to be accompanied by *withdrawal* symptoms that occur when the drinking stops for any length of time. The symptoms can last a few hours or several days, including anything from depression to convulsions, fits, and ultimately, delirium. The gloomy feeling and the short, fitful sleep of a 'hangover' are mild symptoms of withdrawal, usually compounded by the toxic effects of the acetaldehyde, which appear as

nausea and headache. In large quantities, alcohol has long-term adverse effects on most of the organs in the body, particularly the brain, stomach, liver, and heart (Kinney and Leaton 1978; Ewing and Rouse 1978a).

Defining Alcohol Abuse and Alcoholism

Alcohol abuse is a catch-all term to describe the misuse of alcohol that results in problems or disabilities (NIAAA 1978:13). The problems are usually grouped as: *psychological* problems, which include tolerance for and dependence on alcohol, and loss of control while drinking; *medical* problems, both acute and chronic; and *social* problems, particularly in employment and family life. With such a broad base it has proved difficult even for experts to agree on definitions. One of the few areas of consensus has been the separation of 'alcoholism' from other drinking-related problems. In 1937 Chafetz defined alcoholism as:

> *. . . a chronic behavioral disorder manifested by an undue preoccupation with alcohol and its use to the detriment of physical and mental health, by loss of control when drinking is begun, and by a self-destructive attitude in dealing with personal relationships and life situations (quoted in Ewing and Rouse 1978:97-99).*

This definition focuses on a preoccupation with alcohol, but it does not stipulate either the amount consumed or the level of intoxication that is reached. It also emphasizes personally self-destructive behavior and interpersonal relationships. More recently the World Health Organization has suggested that the terms 'alcoholism' and 'alcohol addiction' be replaced by a more general term, 'alcohol dependence syndrome,' which is defined as:

> *. . . a dependence on alcohol, characterized by an overwhelming need to ingest large amounts of alcohol . . . marked by loss or impairment of control over drinking. There is a drive to obtain the gratification of intoxication . . . by means of self-alcoholization (Keller 1977:33).*

The core of the problem is alcohol dependence; but the idea of a syndrome implies that rather than an all-or-nothing illness, alcoholism is manifested in clusters of symptoms. Thus, individuals may present different degrees of impairment.

Many individuals who suffer from alcoholism receive treatment, either in detoxication units of general hospitals, in mental hospitals, half-way homes,or other institutional settings. In 1976, for example, only about 5.8% of patients in public mental hospitals in the United States were diagnosed as alcoholics. However, 24% of all admissions were alcohol-related (NIMH 1978). Implicit in these data is that alcoholics do not stay long in the hospital; in fact, a two- to three-week stay with multiple readmissions is the norm. The rapid turnover rate is indicated by the admission rate per 100 resident patients, which in 1976 was 890.7 for the country as a whole. The admission rate for alcoholics varies substantially from one state to another. For example, in Rhode Island, 55% of all resident patients in 1976 were alcoholics; but in Arizona the figure was 1.7%. Although the variations do not show a clear regional pattern, there is a tendency for alcoholics to be hospitalized at a lower rate in the western states, which parallels the generally low hospitalization rate in the West (Smith and Hanham 1981a). States with the highest

admission rates for alcoholics either have higher admission rates across all diagnoses, or they have hospitalized a disproportionately large number of alcoholics, perhaps because other facilities were not available locally. The latter explanation seems reasonable, because in the states that have the highest overall admission rates, alcohol admissions average 37.6% of total admissions, compared to the national average of 23.9%.

Many problems associated with heavy drinking are much less pervasive and damaging than alcoholism. For this reason the National Institute on Alcohol Abuse and Alcoholism (NIAAA) approves the use of two other terms, 'alcohol-related disabilities' and 'problem drinking' (NIAAA 1978). Disabilities exist when there are impairments in physical, mental, or social functioning that appear to be caused by excessive alcohol consumption (Edwards *et al.* 1977:17). The people who experience such impairments are not necessarily alcoholics, but the risks of becoming alcohol-dependent are obviously high. A problem drinker is a person who drinks alcohol in such a fashion that he encounters some problems, but in most cases he has learned to function with only minor social upheavals and occasional physical symptoms.

In its most recent report to Congress, NIAAA (1981a) suggested that individuals with 'drinking problems' could be identified empirically from their scores on three dimensions: *heavy alcohol consumption* — the quantity of alcohol consumed per month; *alcohol dependence* — physical dependence and loss of control, measured by presence of twelve behavioral syndromes, including: skipping meals when drinking, sneak drinking, morning drinking, pre-party drinking, gulping drinks, and *adverse social effects* — negative consequences of drinking in four areas — social relationships, problems with the police, automobile and other accidents, and problems at work. With data collected in a 1979 national survey of 1,178 adult drinkers, these three dimensions were used to estimate the prevalence of 'drinking problems' in the general population (NIAAA 1981a). Fifteen percent of the sample reported two or more of the dependent behaviors in the twelve months prior to the survey; 9% reported one or more of the adverse social effects; and 18% reported they had drunk heavily, more than 60 drinks per month. In a study of US Air Force personnel, Polich and Orris (1979) concluded that 4.6% of the population under study were alcohol-dependent, and another 9.3% had experienced at least one serious problem that was drink-related. Although the sample population was predominantly male and the alcohol consumption levels are above average, this study is important because it is one of the few existing attempts to identify alcoholism and alcohol-dependence from behavioral measures.

Alcohol Use and Abuse

To explain why a drug with the pharmacological effects of alcohol is available legally without a prescription, we need to consider that alcohol performs a number of services that have become almost indispensible to society. Alcohol helps to reduce the tensions of modern living, although the importance of this function has been questioned in recent literature (Cappell 1975), and it is clearly not an appropriate explanation of drinking in primitive societies. Alcohol also has some important social functions: it acts as a medium for many social events; it is a lubricant for social intercourse; and it is even a medium of exchange in formal and informal transactions. Through the years, alcohol has become integrated into everyday life to such an extent that many social functions cannot be performed without it. In this way, alcohol has acquired a special status that has virtually placed it beyond the law. As Rouse and Ewing (1978:372) have observed,

"Special occasions, like promotions, buying a new house, or marriage are toasted with champagne or some other alcoholic beverage and thereby are considered official."

Many people have argued that alcohol itself is not necessarily a harmful substance, but for certain individuals and in certain circumstances heavy drinking will have disastrous results (Chafetz 1979). As we shall see, a convincing case can be made that drinking problems are at least partly a result of the social and cultural milieu in which the drinking occurs. This argument has been supported by some data collected in drinking surveys which show that although most people drink some alcohol, very few (less than one in six) develop any serious alcohol-related problems (Cahalan 1970).

Alcohol's tradition and the ease with which it can be produced help to explain why it is the major drug of our time, and why it is still legal. For centuries the benefits of alcohol have been extolled. Alcohol has been sung about and worshipped all over the world: as a medicine ; a source of food; a supplier of energy; and an aphrodisiac (Darby 1978). Most of these claims have been exaggerated: for example, alcohol is not an effective source of food; and although it has been known to increase sexual desire, it often impairs performance. By discounting these claims we are left only with the benefits of alcohol as a tranquilizer and an intoxicant (S. Shaw *et al.* 1978). It is important to note, however, that on the strength of these benefits alcohol's supporters have been able to resist or recover from powerful prohibition movements in many countries. In spite of numerous attempts on his life, John Barleycorn is alive and well. As a folksong notes: "Little Sir John's grown a long, long beard, and so amazed us all."

Like many other drugs, alcohol produces failings in the individual. The signs are predictable, easy to identify, and swift — in fact the effect is often present even when the alcohol is not (Marlatt and Rohsenow 1980). Unlike many other drugs, however, alcohol consumed in moderate quantities is harmless, and its effects disappear quickly without a trace. With the possible exception of marijuana, no other drug is used so widely as a facilitator of social interaction in modern societies.

Perhaps alcohol's prevalence and legality are not related to individual or collective benefits of drinking but to the vested interests of government and industry. In 1977 the total consumer expenditure on wine, spirits, and beer in the United States was more than $35 billion; alcohol sales contributed 25% of the federal government's receipts from excise taxes ($5.3 billion compared with $2.4 billion for tobacco — Rouse and Ewing 1978). In the United Kingdom, spending on alcohol was estimated to be 10% of all consumer spending in 1976. Alcohol contributed a total of £1.9 billion to the government in collected taxes (S. Shaw *et al.* 1978).

From the earliest times,the production of alcohol has had economic functions that have been at least as important as its pharmacological effects. It was soon recognized that making alcohol was an effective way to store surplus food; to reduce its bulk and increase its value; and to protect it against spoilage from pests and the weather. Along these lines, a utilitarian explanation has recently been suggested for the popularity of brandy in medieval Europe (Ewing and Rouse 1978b). The English had developed such a taste for French claret that merchants realized they could reduce the bulk, pay less in import levies, and therefore make more profit by distilling the wine before shipment. The original idea was to reconstitute the wine after it reached its destination, but the distilled brandy became so popular that dillution was not necessary.

In modern times the production and distribution of alcohol is a highly profitable business, often the major source of income and employment in an entire region. The beverage industry also spends a vast amount to cultivate the demand for its products through advertising. In 1977, about $687 million was spent on advertising, which

represents anywhere from 3-7% of the sales of major beer, wine, and spirits producers. The economic importance of alcohol tends to cloud the debate about the relative benefits and problems of drinking. Without it, thousands would be out of work, and millions would be denied access to an activity that causes them no harm (Bunce *et al.* 1979; Beauchamp 1976).

From time to time the 'drinking is good for you' argument resurfaces with new evidence linking alcohol consumption to lower mortality and morbidity rates, particularly for diseases related to heart conditions (Darby 1978; Klatsky *et al.* 1981a, 1981b). Not surprisingly, the alcoholic beverage industry supports such arguments. Their position is a familiar one, namely that alcohol does not *cause* alcoholism, just as 'guns do not cause homicides.' Other researchers have noted that per capita alcohol consumption in the United States has peaked (NIAAA 1981a). Because more people are drinking now than ever before, this suggests that existing drinkers may be reducing their consumption. As we shall see, overall changes in per capita alcohol consumption obscure some significant changes in regional consumption levels. It appears that a convergence has occurred as a result of a reduction in consumption in the 'wettest' states, and an increase in consumption in the 'driest' states.

Returning to the arguments in favor of alcohol consumption, a number of observers have suggested that the consumption 'problem' may have been exaggerated. For example, a modest daily consumption level adds up to what looks like an ocean of alcohol over the course of a year. Drinking one cocktail each day is the equivalent of six gallons of spirits per person, and two beers a day adds up to more than 100 gallons in a year. As high as the level of consumption is in the United States, it appears to be

TABLE 3 ESTIMATED DEATHS ATTRIBUTED TO ALCOHOL, UNITED STATES, 1975

Cause of Death	No. of Deaths 1975	% Alcohol Related[a]	No. Alcohol Related
DIRECT CAUSES:			
Alcoholism	4,897	100%	4,897
Alcoholic Psychosis	356	100%	356
Cirrhosis	31,623	41-95%	12,965-30,042
Sub-Total	36,876		18,218-35,295
INDIRECT CAUSES:			
Accidents			
Motor Vehicles	45,853	30-50%	13,756-22,926
Falls	14,896	44.4%	6,614
Fires	6,071	25.9%	1,572
Other	33,026	11.1%	3,666
Homicides	21,310	49-70%	10,442-10,013
Suicides	27,063	25-37%	6,766-10,013
Sub-Total	148,219	29-40%	42,816-59,708
TOTAL	185,095		61,034-95,003

[a]Estimates of the proportion of deaths attributable directly or indirectly to alcohol were made by Day (1976).
Source: NIAAA 1978: 19.

TABLE 4 ECONOMIC COSTS OF ALCOHOL ABUSE AND ALCOHOLISM, UNITED STATES, 1975

Category	Cost (billion $)
Lost Production	19.64
Health and Medical	12.74
Motor Vehicle Accidents	5.14
Violent Crime	2.86
Social Responses[a]	1.94
Fire Losses	0.43
Total	42.75

[a]Social responses include costs related to the criminal justice and welfare systems, plus the cost of alcoholism treatment programs and other alcohol-related costs in the public sector, such as fire protection and highway safety.

Source: Berry *et al.* 1977 (reproduced in NIAAA 1978:31).

insignificant when compared with the consumption in some European countries. Finally, as Rouse and Ewing (1978a) have observed, alcohol is not an important part of life for many Americans. We drink three times more milk than alcohol, more soft drinks, and as much coffee, tea, and cocoa.

People concerned about alcohol consumption also make an impressive case. Although the proportion of problem drinkers is relatively low, absolute numbers are staggering. In 1978, for example, NIAAA estimated that ten million Americans experienced some problems as a result of their drinking practices. The number of people indirectly affected may be three or four times as high if one includes family members and co-workers (NIAAA 1978). Even more impressive are the statistics on young drinkers. Self-report surveys of 10-12th graders in 1974 and 1978 showed that nearly 15% were heavy drinkers (NIAAA 1981a). Alcoholism is a progressive but slowly developing illness. From all accounts, heavy drinking at an early age is an effective predictor of subsequent problem drinking (Cahalan 1970).

In addition to the prevalence data on problem drinking, alcohol is implicated directly and indirectly in deaths from a wide range of causes, including illnesses, accidents, homicides, and suicides. In 1975, for example, more than 35,000 deaths were directly attributed to alcohol, and another 60,000 were related indirectly (Day 1976; Table 3). In addition, deaths from illnesses in which alcohol was probably a causal factor (including some cancers, heart diseases, pancreatitis, stillbirths, and fetal alcohol syndrome) bring the total to 205,000 deaths — 11% of all deaths in 1975. Alcohol was the third highest cause of death in the United States. People who drink five or more drinks at least four times a week have a mortality rate two to three times higher than normal; for the entire population this means 140,000 deaths in excess of the general mortality rate (Day 1976). A medical examiner in North Carolina has observed that above-legal blood-alcohol levels are present in a quarter of all cases he investigates (Hudson 1978).

In spite of these statistics, perhaps the strongest case that can be made against alcohol is the economic argument. Alcohol abuse and alcoholism were estimated to have cost the United States nearly $43 billion in 1975 (Table 4). This estimate represents only the tip of an iceberg. It completely ignores hidden costs of alcohol problems,

including the role of alcohol in child abuse and other types of family violence and in the general disruption of personal lives.

As this brief overview demonstrates, the alcohol debate is far from settled. Almost everyone agrees that excessive consumption is dangerous — even lethal — to many people, some of whom are innocent bystanders. There is also agreement that some restrictions on alcohol availability are necessary. In spite of these agreements, alcohol remains legal, easily available, and relatively cheap in almost all parts of the world. In the chapters that follow, we shall attempt to explain this apparent contradiction and we shall also consider some of its implications.

2

Society, Culture, and Drinking Behavior

'The West has nothing equivalent to vodka, the way the Russians drink it. . . . The mere mention of vodka starts Russians salivating and puts them in a mellow mood.'
(Hendrick Smith, The Russians, *p. 161).*

The way people drink alcohol, and what they drink is culturally determined. Alcohol is ingested as a beverage in most parts of the world but in no two places are drinking practices identical. To organize our brief survey of cultural variations in drinking around the world, we have used some of the more traditional themes within cultural geography: cultural ecology; cultural regions; cultural diffusion; and cultural integration (Jordan and Rowntree 1982).

The Cultural Ecology of Drinking

One of the reasons alcohol interests social scientists is that its effects on human behavior can be studied empirically. In spite of many variations in taste, texture, and strength, the chemical effects of alcohol should be comparable from one locality to another. This assumption is based on scientific knowledge of the pharmacological effects of alcohol on the brain. We know that alcohol launches a toxic assault on the higher brain centers, which temporarily frees the drinker from his or her everyday inhibitions. Unfortunately, for science, the evidence from numerous cross-cultural drinking studies contradicts this traditional wisdom, because with equal levels of consumption there are wide discrepancies in resulting behaviors (Pittman and Snyder 1962; Heath 1975, 1976).

The way people act when they have been drinking to excess, their 'drunken comportment,' to use MacAndrew and Edgerton's (1969) phrase, varies considerably from one place to another. At one extreme is the evidence that in some cultures individuals drink excessively without exhibiting the symptoms most familiar to a western eye. Among the Camba of Eastern Bolivia, for example, men consume huge quantities of undiluted distilled cane sugar that is 89% ethyl alcohol (Heath 1958). In a weekend binge, drinkers may pass out and be revived several times to continue drinking, but hangovers, withdrawal symptoms, and dependence on alcohol is non-existent. The effect of alcohol is apparently based only partly on its role as a chemical disinhibitor — the balance is determined by a variety of social and cultural influences. Evidence from

five diverse societies suggests that traditional inhibitions on behavior remain in effect even when individuals are heavily intoxicated (MacAndrew and Edgerton 1969). People may be staggering and slurring, but their social behavior remains within bounds. One interpretation of these observations is that an individual's 'drunken comportment' is determined primarily by society's definition of drunkenness and the behaviors that are considered appropriate after heavy drinking.

The study of drinking behavior has attracted cultural anthropologists and is of potential interest to cultural geographers for a number of reasons. The most obvious of these is the universality of drinking. The production and consumption of alcohol has infatuated a wide range of human populations across the globe. It can be made easily and quickly from a multitude of local products; and it has definite, predictable, and speedy effects. Alcohol is the world's most popular drug. It has been worshipped and forbidden, but it has rarely been ignored. It has never been simply another drink — in fact it has assumed a significance in social and ritual life that belies its ubiquity and ease of production. For the Kofyar of Nigeria, beer is the essence of life, a constant companion and a medium of exchange. Kofyar men regularly offer beer to the spirits, and they believe that "man's way to god is with beer in hand" (Netting 1964 quoted in Mandelbaum 1965:281). For the Russians, as Hendrick Smith (1976) has observed, vodka has a similar status.

In spite of the antiquity and ubiquity of alcohol, its use in most modern societies has been controlled by regulations that are rarely applied to other beverages. The regulations define who can drink what, when, where, and at what price. Attitudes toward drinking vary almost as much as the variations in regulations, and one of the most quoted attempts to make sense of the worldwide hodge-podge of cultural attitudes toward alcohol includes the following categories (Bales 1946): *complete abstinence*, which is an ideal rather than an actual condition in many societies; a *ritual attitude* in which alcohol is sacred and plays an important role in ritual activities and religious functions; a *convivial attitude*, in which alcohol has a largely social and hedonistic function; and a *utilitarian attitude*, where the use of alcohol is justified for one or more practical purposes, such as a food or a medicine, or even as a direct way to relieve tension through drunkenness. Unfortunately, this classification does not produce a neat map of global attitudes toward alcohol because in many countries the entire range can be observed by comparing spatially or demographically distinct sub-populations. In the newly settled United States, for example, the full spectrum of attitudes and behaviors was evident in most of the eastern seaboard cities. Groups with radically different views on the subject of alcohol were thrown together, which may have been at least partly responsible for some of the enduring stereotypes about ethnic drinking practices. The Irish in America are stereotypically legendary in their heavy drinking and drunkenness; but the Jews and Italians are supposedly famous for their moderation. It is plausible that at least part of both stereotypes is a result of the proximity of Irish settlers to Jews and other moderate drinkers like the Italians (Greeley *et al.* 1980).

Cultural forces may have a controlling influence on alcohol abuse by setting the rules that limit consumption. At the same time, these forces may encourage heavy and harmful drinking by assigning a high value either to the beverage itself or to the act of drinking. In some cultures drinking may symbolize one's ethnic identity, which has been suggested for the Irish in America (Stivers 1976; Bales 1962). In other cultures drinking has come to represent the 'good life' and even, as in France, the only way of life (Anderson 1968; Sadoun *et al.* 1965). Culture may also act as an agent of stress, creating anxieties that can only be assuaged by heavy drinking. The effect of these

stresses will be determined largely by the extent to which the culture provides other ways to relieve tensions. In one study it was suggested that male drunkenness is most common in cultures where men have a strong need for achievement and power, but where few societal outlets exist for strong male solidarity (McClelland *et al.* 1972).

Studies of cultural effects on drinking practices can be grouped into two major categories. The first includes studies of cultural uniqueness, documenting the rich diversity of drinking practices around the world. The second includes supra-cultural analyses that attempt to provide macro-level theories of drunkenness. The *cultural uniqueness* studies suggest a high level of superficial diversity in drinking behaviors (see, for example, Everett *et al.* 1976), but a closer examination reveals a substantial amount of similarity (Mandelbaum 1965). Almost everywhere heavy drinking is a predominantly male activity, and it usually involves peers rather than cross-sections of the population. Drinking is generally considered to be the prerogative of people who work hard and encounter the physical elements on a daily basis. Thus laborers and warriors are generally expected to be heavy drinkers. Sobriety is usually required of those who perform important social, religious, or ritual functions, which in our culture includes surgeons and airline pilots. Pittman (1967) has suggested that some broad cultural variations in drinking practices include abstinence, ambivalence, permissiveness, and overpermissiveness. It is relatively easy to identify one or more clear-cut examples of each category, but spatial variations within a particular country, and rapid changes in drinking practices over time, call into question the long-term validity of Pittman's classification. In the next section we shall return to this question when we try to define cultural regions empirically on the basis of drinking practices.

Numerous attempts have been made to outline *supra-cultural* laws of drinking and their effects on human behavior. The most impressive of these have moved beyond intuitive and descriptive comparisons of drinking practices in different cultures. A landmark study was conducted by Horton (1943), who used the data in the Cross-Cultural Survey at Yale University to describe drinking practices in 77 societies. Horton devised a scale based on the level of drunkenness that is typically reached, and he hypothesized that drunkenness could be predicted by the level of anxiety within the society. Anxiety was measured by the amount of external acculturation the society has encountered and the society's uncertainty about its ability to provide enough food for all its members. The results supported the general hypothesis, and Horton argued that drunkenness is more prevalent in primitive hunting and gathering economies than in agricultural economies. Field (1962) made a similar observation, but he suggested that the explanation lay not in the anxiety levels associated with insecure food supplies, but in differences in social organization. High levels of drunkenness, Field argued, are most common in the absence of stable kin groups. A later study of 139 primitive societies suggested that conflict over dependency is the major determinant of drunkenness (M.K. Bacon *et al.* 1965). Drunkenness is more common in societies where children receive conflicting messages about the desirability of dependence as opposed to independence. M.K. Bacon and colleagues stated, "As a reaction to dependency conflict, alcohol has a triple function: it reduces anxiety and tension; it permits the satisfaction of desires for dependence; (and) it permits uncritical indulgence of unrealistic fantasies of achievement" (quoted in Heath 1975:21). Later studies have investigated further the importance of the achievement motive as an explanation for heavy drinking. McClelland and his colleagues (1972) argued that men drink largely to experience a feeling of power, which explains why drunkenness is prevalent in cultures that do not institutionally stress maleness. As McClelland (1972:334) observed:

Men drink primarily to feel stronger. Those for whom personalized power is a particular concern drink more heavily. Ingestion of alcohol cues off thoughts of strength and power in men everywhere, apparently for physiological reasons.

The major strength of these extensive supra-cultural studies is their large-scale sampling, which reduces the risk of observer prejudice. Their disadvantages are equally obvious. For example, it has been argued that to understand what alcohol means to a specific culture requires a lengthy and thorough investigation by a perceptive observer. The studies mentioned here assume that the causal agents of drunkenness — anxiety, acculturation, subsistence insecurity, loose social organization, and the need for power — influence individuals in identifiable ways that are invariant across cultures. This assumption is clearly contradicted by many of the in-depth 'uniqueness' studies.

Cross-cultural studies have, almost incidentally, improved our understanding of drunkenness in modern societies. For example, S.D. Bacon (1962) has argued that cultural change in part explains why modern technological societies are the only ones in which alcoholism is experienced by people who drink heavily. In simple societies alcohol has a number of positive functions: it is a food, a thirst quencher, and a form of medicine. Modern societies have all but eliminated alcohol's role in these functions, replacing it with numerous single-purpose products, and inventing new functions for alcohol. True to fashion, alcohol appears to have been adapted well to these new roles. It appears to be an effective way to reduce tension, to loosen inhibitions, and lessen depression. Most modern societies have also created a wide range of establishments and situations in which drinking is the sole activity; and in many countries alcohol has become one of the major employers and money-makers. On the other hand, these modern functions of alcohol, and the relatively new patterns of consumption, are often counter-productive to the major goals of a modern society that is increasingly complex, specialized, and mechanized. Bacon suggested that modern societies have a greater need than ever before for caution, timing, and cooperation — all of which are rapidly impaired by alcohol. In addition, it is much more difficult to control drinking in modern societies than it was (and is) in more traditional groups. Ritualistic, open-air, large-scale drinking has been replaced to a great extent by small-group and individual drinking. Drinking now occurs anywhere and everywhere, virtually free from public scrutiny and independent of social norms (Czikszentmihalyi 1968).

Chafetz (1964) echoed Bacon's argument when he observed that alcoholism is not a serious problem in many cultures where drinking is commonplace. The most familiar examples are Italians, Jews, Thais, Chinese, and Japanese. Chafetz (1964:403) suggested that in these cultures there is . . . "family closeness, a relaxed form of drinking, (and) a disapproval of drunkenness," which, he argues, is not the case in the United States, where drinking ". . . is done as we live: in a rush. We stand to our drink and we gulp it as though we were quenching a thirst." Chafetz suggests that drinking should occur in a relaxed setting. Alcohol should be made more available rather than less, so that drinking would become a normal, everyday activity. In spite of the appealing logic of this argument, the high prevalence of alcohol-related mortality among Italians and in many other countries where alcohol is widely available indicates that greater availability is not a problem-free solution (S. Shaw *et al.* 1978). Recent statistics from third-world countries (Edwards 1979) and rapidly industrializing countries like Japan indicate that cultural change is an effective predictor of sharp increases in the

prevalence of alcohol-related problems. It is reasonable to suggest, therefore, that S.D. Bacon's hypothesis is at least plausible. As traditional customs are replaced by complex social and economic institutions, the old functions of alcohol have been made redundant. They have been replaced with new functions that have potentially damaging consequences.

Drinking Regions

At a particular level it is possible to delineate distinct regions according to variations in drinking practices. At the global level, comparisons between countries are difficult because of differences in preferred beverages, alcohol content, and taxation levels. An additional problem is the consumption of home-brewed or distilled alcohol, which in the Soviet Union, for example, may be as much as 30% of the total (Treml 1975). Realistic comparisons can only be made for countries in which most of the alcohol is produced in and distributed through official market channels, which effectively limits the data to industrial countries, mostly in the West.

Data collected by Keller and Gurioli (1976) for 26 countries show that the United States was ranked 15th overall in per-capita alcohol consumption, with 2.78 gallons of pure ethanol per person per year (Table 5). Consumption is highest in the wine drinking countries of Portugal, France, and Italy and generally lowest in those countries where spirits are preferred (Sulkunen 1976). A number of conclusions can be drawn from alcohol consumption data:

(1) Alcohol consumption varies dramatically around the world. Europeans drink about half of the Western world's marketed alcohol, but per-capita consumption within Europe varies from 6.27 gallons in Portugal to 1.16 gallons in Iceland.
(2) The consumption of alcohol is closely tied to its production, particularly for wine (with the exception of Algeria, where religion limits the consumption of locally produced wines). Countries that import most of their alcohol are usually among the lowest consumers.
(3) The production, and consequently the consumption, of wines and spirits appears to be more closely tied to physical geographical factors than is the case for beer. Wine growing requires a favorable geographic location, and the production of liquor is largely dependent on the source of its major agricultural ingredients. In comparison, beer can be brewed in many locations, with water supply the major determinant. It is not surprising, therefore, to find that beer consumption is higher in industrial countries and lower in countries where the workforce is predominantly agricultural.
(4) Large-scale 'alcohol culture regions' can be identified, with some geographical clustering, for example, in the Mediterranean region and Eastern Europe. The most traditional classification includes 'wine,' 'beer,' and 'spirits' countries (Table 6). In the 'wine' countries, overall consumption is high, mainly because wine is accessible, cheap, and generally considered to be an essential complement to food. In 'spirits' and 'beer' countries, alcohol consumption is

TABLE 5 APPARENT PER CAPITA ALCOHOL CONSUMPTION (gallons)

Country	*Spirits* (Rank)	*Wine* (Rank)	*Beer* (Rank)	Total
1. Portugal	0.46	5.27 (1)	0.54	6.27
2. France	0.80	4.07 (2)	0.99[c]	5.87
3. Italy	0.66	3.79 (3)	0.24	4.69
4. Switzerland	0.75	1.70 (5)	1.39[c]	3.85
5. Spain	1.07 (4)	2.18 (4)	0.53	3.78
6. W. Germany	0.91	0.82 (10)	2.02 (4)	3.75
7. Austria	0.84	1.25 (7)	1.63 (7)	3.72
8. Belgium	0.61	0.63	2.15 (3)[c]	3.39
9. Australia	0.47	0.45	2.40 (1)	3.32
10. Hungary	1.00 (7)	1.54 (6)	0.69	3.23
11. New Zeland	0.49	0.35	2.34 (2)	3.18
12. Czechoslavakia	0.92 (10)	0.57	1.49 (10)	2.98
13. Canada	1.01 (6)	0.32	1.51 (9)	2.84
14. Denmark	0.53	0.55	1.71 (6)	2.79
15. USA	1.14 (3)	0.34	1.31	2.78
16. United Kingdom	0.53	0.28	1.94 (5)	2.76
17. Netherlands	0.97 (8)	0.44	1.34	2.75
18. Ireland	0.78	0.14	1.56 (8)	2.47
19. Soviet Union	1.22 (2)[d]	0.91 (8)	0.21	2.34
20. Poland	1.43 (1)	0.29	0.49	2.21
21. Finland	1.07 (4)	0.24	0.82	2.14
22. Sweden	0.87	0.30	0.67	1.84
23. Japan	0.44[a]	0.86 (9)[b]	0.46	1.77
24. Norway	0.63	0.15	0.69	1.47
25. Iceland	0.94 (9)	0.10	0.12	1.16
26. Israel	0.48	0.18	0.20	0.86

[a]Includes shochu.
[b]Includes saki.
[c]Includes cider.
[d]Does not include illegally produced samogan.
Source: NIAAA 1978:6. Data based on population 15 years and older.

associated more with social and leisure functions, and any nutritional role is usually limited to incidental pre- or post-prandial consumption. Although there are clearly defined 'spirits,' 'wine,' and 'beer' countries, it is also evident that within the last two or three decades, homogenization of beverage preferences has occurred at the international level (Sulkunen 1976; Ahlström-Laakso 1976).

(5) There is a tendency for alcohol consumption to be more polarized among the population in 'spirits' countries than in 'wine' or 'beer' countries. For example, Skog (1980) has shown that in Finland only a small percentage of the population are regular consumers, while the majority are abstainers. Without detailed survey data it is difficult to generalize this conclusion to 'spirits' countries where the overall consumption is higher, such as Poland and the Soviet Union, but it appears that Finland may be an exception, largely

TABLE 6 BEVERAGE PREFERENCES AND CONSUMPTION INCREASES IN SELECTED COUNTRIES, 1950-1970

Countries	Preferred Beverage's Share of Total Alcohol Consumption (1952)	Consumption Increase 1950-1970 (1950=100)	Mean Annual % Increase
	Wine Countries		
France	79.1	93.0	-0.3
Hungary	78.5	177.0	4.2
Italy	90.8	148.6	2.1
Portugal	95.8	109.3	3.7
Rumania	60.8	133.8	0.1
Spain	69.8	144.4	1.8
Switzerland	51.7	151.9	2.4
	Beer Countries		
Australia	73.8	126.9	1.5
Austria	43.5	210.4	4.6
Belgium	78.4	126.0	1.5
Canada	61.7	133.2	1.8
Czechoslovakia	63.1	163.0	3.4
Denmark	78.3	168.1	3.0
W. Germany	50.2	287.0	6.5
Ireland	75.0	132.8	1.8
Luxembourg	43.1	139.5	2.5
New Zealand	75.3	126.4	1.8
United Kingdom	87.1	125.7	1.3
USA	51.7	115.5	0.9
	Spirits Countries		
Bulgaria	59.2	498.4	7.7
Cuba	53.2	89.2	-1.7
Cyprus	43.3	106.1	-1.3
Finland	59.5	185.6	4.3
E. Germany	49.5	396.3	9.5
Iceland	46.1	255.3	4.0
Israel	58.3	131.9	-0.4
Netherlands	68.1	253.1	5.3
Norway	51.2	160.3	2.6
Peru	65.8	208.4	5.7
Poland	71.2	178.4	3.0
S. Africa	48.9	159.4	2.8
Sweden	63.7	143.2	2.0
Turkey	55.2	135.6	5.4
Yugoslavia	72.9	269.1	6.5

Source: Adapted from Sulkunen 1976:238,249. Copyright 1976 by John Wiley & Sons, Inc. Included by permission from R. J. Gibbens *et al.*, *Recent Advances in Alcohol and Drug Problems*, Vol. 3.

> because of its temperance tradition and a relatively recent experience with prohibition. It is possible that, in comparison to 'wine' and 'beer' countries, drinking in 'spirits' countries is more *utilitarian,* to use Bales' (1946) terminology, than in 'wine' and 'beer' countries. In other words, alcohol may be used more often in 'spirits' countries as an intoxicant than as a social lubricant or an aid to digestion.

A variety of journalistic reports in recent years have described to western readers a massive increase in alcohol consumption, and the prevalence of problem drinking, in communist countries. One such report noted that in Poland expenditures on food and drink had doubled between 1960 and 1977. Stories of 800,000 public drunks on the streets of Poland every day encouraged the recall of a popular Solidarity joke. . . . "Between the stage of advanced socialism and full communism, there is an intermediate stage — progressive alcoholism." (*The New York Times:* March 8, 1981). In one of the few serious empirical studies, Treml (1975) has validated some of these observations, at least for the Soviet Union. Treml found that alcohol consumption in the Soviet Union increased at an average of 5.6% per year between 1957 and 1975. This figure includes the consumption of illegally-produced samogan, which in many rural areas is as much as one third of the total. By these calculations, the Soviet Union's per capita consumption, in 1972, was 11.26 liters, which makes it the twelfth highest overall consumer of the world (Keller and Gurioli 1976), and easily the highest consumer of 'spirits' (8.07 liters per capita, 5.12 of which was produced by the state).

Treml (1975) noted some major regional variations in alcohol consumption within the Soviet Union. In an analysis of consumption levels in the fifteen Soviet Republics, with the R.S.F.S.R. divided into its sixteen autonomous republics, consumption varies inversely with the proportion of Muslims and the percentage of the population that is rural.

It is even more difficult to make global comparisons of the prevalence of drinking drivers, drunkenness arrests, and hospital admissions — at least part of which results from international variations in diagnostic categories and legal practices (Table 7). The most reliable indicator of alcohol-related problems is the mortality rate from liver cirrhosis, which shows France as the highest, with the other 'wine' (and to a lesser extent 'beer') countries close behind. The data in Table 7 are not encouraging for those people who argue that drinking ought to become more integrated into everyday life, as it is in many of the European 'wine' countries. Although there is some evidence that in these countries public displays of drunkenness and other legal problems may not be as high as the consumption levels would predict, the increased availability and accessibility of alcohol and the inevitably higher levels of consumption are strongly correlated with cirrhosis mortality. Almost all the available evidence points to a world-wide increase in the production and consumption of alcohol, and alcohol-related mortality rates are also rising (Popham *et al.* 1975; Schmidt 1977). World beer production increased by 41% between 1960 and 1968; wine increased by 15%, and liquor by 40% (Sulkunen 1976). The magnitude of the increase in some countries has been spectacular, and the largest increases have occurred in the 'spirits' countries (Table 6). For example, in Bulgaria, Peru, and Yugoslavia, consumption increased by more than 100% between 1950 and 1970, compared to an average increase of 40% in 'wine' countries, and 25-30% in 'beer' countries. France and Portugal are the only countries in which consumption levels have fallen, which suggests they may have reached a 'saturation' level.

TABLE 7 ALCOHOL CONSUMPTION AND PROBLEM INDICATORS IN SELECTED COUNTRIES

Country	Mean Consumption (liters per person > 15 yrs. 1970)	% Abstainers	Cirrhosis Mortality (per 100,000; 1965-1969 Average)	Drunk Driving Charges (per 100 million vehicle kms.)	Public Drunkenness Charges (per 100,000 population)	Mental Hospital Admissions (per 100,000 population)	Pedestrians and Drivers Under Alcohol Influence in Accidents (per 100 million vehicle kms.)
Norway	4.9	30	4.1	46.3	—	1.190	7.9
Finland	6.4	27	3.5	53.3	10.1	5,019	45.3
Japan	6.6	44	10.7	64.2	12.5	135	34.0
Ireland	7.3	30	3.1	17.7	—	157	59.7
Netherlands	7.8	7	3.8	16.5	8.7	56	7.6
Sweden	8.0	23	7.2	28.6	4.1	1,700	51.8
United Kingdom	8.3	10	3.2	12.8	6.1	214	13.9
Canada	9.5	20	7.1	40.2	—	1,102	55.6
Denmark	9.7	7	8.0	31.5	10.9	460	30.4
USA	9.7	32	14.0	62.6	—	1,487	37.1
New Zealand	11.0	15	2.8	18.9	—	149	27.9
Australia	11.7	16	5.3	44.9	—	1.677	98.1
Austria	13.3	5	28.6	33.4	14.8	—	53.3
Czechoslavakia	14.6	10	12.1	—	—	—	31.6
W. Germany	16.1	3	23.3	—	17.9	—	—
Italy	20.8	10	25.2	—	0.1	—	7.1
France	24.0	5	35.0	18.9	—	—	43.7

Source: Adapted from NIAAA 1978:23.

Drinking in the United States

Alcohol consumption in the United States has traditionally been lower in the Southeastern and Midwestern regions than in the Northeast and the West. Clear differences in sales, drinking habits, and attitudes toward alcohol make it possible to identify 'wetter' and 'drier' regions (Table 1, p. 4). As we shall see later, preferences for different beverage categories vary significantly across the United States. 'Wine' states are generally located in the 'wetter' regions, and the 'spirits' states are in the 'drier' regions. This essentially confirms Sulkunen's (1976) global observation that overall consumption levels are largely determined by beverage preferences.

For most of the 20th century, regional differences in attitudes and behavior toward alcohol have been stable (Table 1), but during the 1970s some significant changes occurred. In 1970, daily alcohol consumption in the South, for example, was .76 ounces of pure alcohol per person, compared to .98 ounces in the Northeast (Malin *et al.* 1980). From a difference of 14% in 1970, by 1978 the South was only 8% behind the leading region, which was the West (Figure 2). Absolute consumption is still lowest in the South (with the exception of Florida and Louisiana), in Utah, and in some midwestern and Great Plains states, such as Kansas, Oklahoma, and Indiana. Declining consumption in many of the 'wetter' states in the North and East, and the rising consumption in the 'drier' states, produced a significant amount of regional convergence in alcohol consumption by the end of the 1970s (Table 8). For example, between 1970 and 1978, per capita alcohol consumption fell by 18% in Washington, DC; 8% in New York and New Jersey; 5% in Delaware; and 5% in Connecticut (Malin *et al.* 1980).

A geographical interpretation of the convergence phenomenon is possible by comparing the changes in alcohol consumption with population changes during the same years. If we were to draw a map showing the increase in alcohol consumption from 1970 to 1978, it would look similar to the now familiar map depicting the 'Frostbelt' and the 'Sunbelt'. The correlation between consumption and population growth is 0.46. In states where alcohol consumption increased by more than 10%, population growth was between 12% and 15% over the eight-year period, compared to the states where alcohol consumption was stable or declining, which had an average population growth of less than 5%. It is possible that people who have been leaving the manufacturing core areas for the Southern, Southwestern, and Mountain states drink more heavily than is the norm for the areas to which they have migrated. They may buy more alcohol and set a high consumption example for their new neighbors in the Sunbelt. Many of the states that encountered high population growth in the 1970s also experienced substantial urbanization and received more than their share of young, affluent, and mobile individuals (Weinstein and Firestine 1978; Kasarda 1980; Beyers 1979). The alcohol

TABLE 8 SPATIAL CONVERGENCE IN ALCOHOL CONSUMPTION AMONG STATES, 1970-1978

	Coefficient of Variation			
Year	Wine	Spirits	Beer	Total
1970	65.6	56.6	22.2	37.8
1978	62.3	49.1	19.7	32.4

Source: Authors' calculations from NIAAA data.

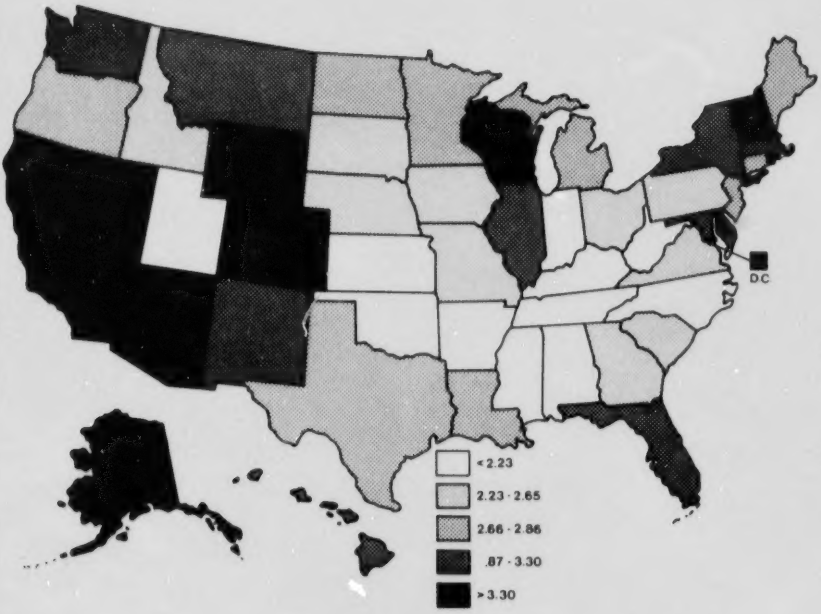

FIGURE 2 ALCOHOL CONSUMPTION IN THE UNITED STATES, 1978 (Data in gallons per capita from Malin *et al.* 1980).

epidemiology literature suggests that consumption is typically higher under these circumstances and is particularly responsive to upward shifts in disposable income (Popham *et al.* 1975; Benner 1975). The convergence in alcohol consumption patterns may be simply another indicator that cultural differences within the United States are inexorably fading away. As the residents of previously deprived regions become wealthy and more urbanized, their propensity to consume alcohol increases. Relationships between regional change and drinking practices demand further investigation.

Per capita alcohol consumption in the United States increased from 2.53 gallons in 1970 to 2.73 gallons in 1978. As we have seen, increases in some regions were much larger than in others, and in some areas consumption declined. A further analysis reveals that the changes in consumption levels were not uniform across the major beverage categories. Spirits appear to have been the major loser during the 1970s — absolute consumption fell in 23 states, compared to beer consumption, which increased in all states, and wine, which increased in all but four states. As these figures suggest, during the 1970s spirits were being replaced by the other beverages, and by 1978 the spirits share of the total alcohol consumption had declined in all but two states (Louisiana and West Virginia), whereas wine and beer had increased their share of the alcohol market in 44 and 47 states, respectively.

To characterize the geographical pattern of changes in beverage preferences, we have analyzed state consumption data, using the percentage shares of each beverage in 1970 and 1978 as input variables. Two factors explained 95% of the overall variance,

and the factor loadings show that, in general, preferences for different alcoholic beverages do not overlap significantly — in fact, preference for spirits is inversely related to the preference for beer, as is the preference for wine (Table 9). From factor scores for individual states, we have identified four basic consumption categories (Figure 3):

(1) *Spirits States* — In states with high positive scores on Factor I, spirits are substantially more popular than the national average, and beer is substantially less popular. In Washington, DC, for example, spirits make up 56% of the total alcohol consumption and beer 27%, compared to 39% and 49% for the country as a whole.

(2) *'Wet' Beer States* — In states with high negative scores on Factor I, beer is the most popular beverage, effectively substituting for spirits. In Pennsylvania, for example, spirits represent 32% of the alcohol market and beer 59%. In general, alcohol consumption in these states is high.

(3) *'Dry' Beer States* — These states have a high negative score on Factor II, indicating that beer is preferred to wine. Kentucky is a representative state in this group, with a beer consumption of 53% and a wine consumption of only 5% of the total, compared to 12% for the country as a whole. With the exception of Wyoming, these are low-consumption states (mean per capita consumption is 2.14 gallons compared to the national average of 2.73 gallons).

(4) *Wine States* — In states with high positive scores on Factor II, wine consumption significantly exceeds the national average, while beer consumption is significantly lower. For example, in California wine makes up 20% of the market and beer 42%. Most of the states in this group are among the highest in overall alcohol consumption in the United States (with the exception of Utah).

The map based on the factor scores (Figure 3) shows that the preference for wine is associated with lower than average beer consumption on the West Coast and in the Northeast and with high beer consumption in the Midwest and Great Lakes states. In

TABLE 9 ALCOHOL CONSUMPTION BY BEVERAGE CATEGORIES, UNITED STATES, 1970-1978

Beverage Share of Over-all Alcohol Consumption	Year	Factor I	Factor II
Spirits	1970	0.978	0.029
Spirits	1978	0.979	0.007
Wine	1970	0.088	0.973
Wine	1978	0.196	0.937
Beer	1970	-0.866	-0.466
Beer	1978	-0.851	-0.482
Variance Explained (Cumulative)		68%	95%

Source: Authors' calculations from NIAAA data.

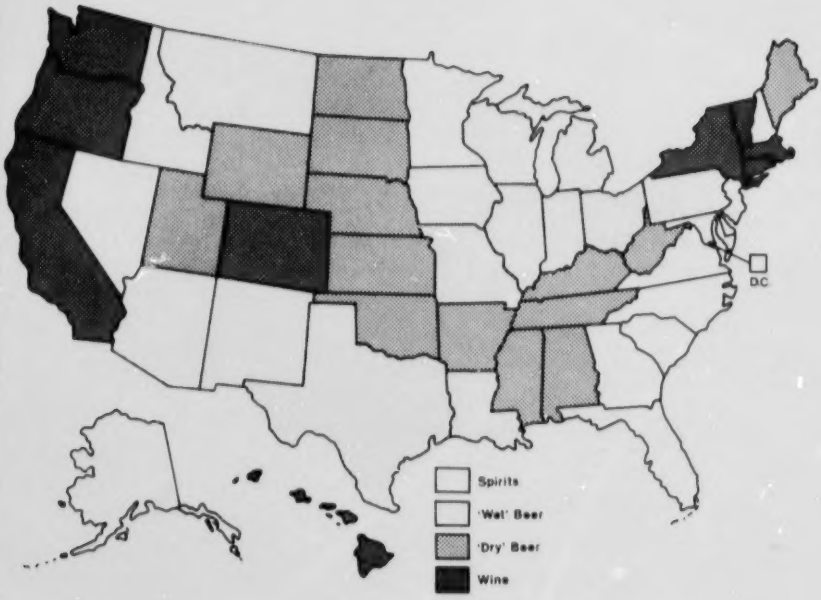

FIGURE 3 ALCOHOLIC BEVERAGE PREFERENCES IN THE UNITED STATES, 1970-1978 (Authors' calculations from data provided in Malin et al. 1980).

the Southwest and two Mountain states, Idaho and Montana, a wine preference is associated with low wine consumption. The map also identifies the 'dry' beer states in the South and on the Plains (W. Virginia, Kentucky, Tennessee, Alabama, Mississippi, and Arkansas — joining up with Oklahoma, Kansas, Iowa, Nebraska, S. and N. Dakota, and Wyoming). In most of these states consumption is significantly below the national average, and the major beverage preference is for beer, which is generally considered to be the 'safest' beverage because of its low alcohol content by volume. In these states, wine consumption is on average less than half that for the country as a whole. These states represent the old hearth areas of the Temperance Movement, and they can be separated from the coastal states in the Southeast — Virginia, N. and S. Carolina, Georgia, and Florida — where consumption is low but preferences are clearly in the direction of spirits. In other words, factor analysis suggests that the 'drier' regions still exist, but that there are some clear regional variations in beverage preferences within the 'dry' belt.

Cultural Diffusion and Drinking Behavior

Something as old and as widespread as drinking has obviously resulted largely from independent invention. For centuries different cultural groups have brewed their favorite drinks and consumed them according to local customs. A global survey of

drinking practices indicates, however, that some significant changes have occurred, particularly in recent times. It appears that drinking habits have diffused in a number of ways. Examples range from the mundane (for example, the increasing popularity of canned beer in Europe) to the profound (the rising alcohol consumption among teenagers in almost all developed countries of the world).

Relocation diffusion occurs when individuals move from one place to another, exporting a particular habit or trait to the new location. In the United States we have ample evidence that the European immigrants brought a wide range of drinking practices with them. Often sharp variations in these practices would be witnessed within a few city blocks. In a more modern context, we also suggested that drinking practices have relocated as a result of recent population movements within the United States. Data from the nationwide drinking surveys only partly support such a hypothesis. Among men aged 21 to 44 who had moved from larger to smaller towns, there were fewer heavy drinkers than among men who remained in the larger cities (Cahalan *et al.* 1969). On the other hand, older men and younger women increased their consumption when they moved from larger to smaller cities. The evidence is mixed — there is some indication that younger men, representing the heaviest drinkers in the population, tend to conform to the prevailing drinking customs when they change their place of residence; but there is also evidence that people moving to smaller cities take their 'big city' drinking habits with them. It is worthwhile noting, however, that many of the recent migrants to the so-called 'Sunbelt' states have not necessarily moved from larger to smaller cities. On the contrary, many have been moving from areas where urbanization is slowing down to areas that are urbanizing rapidly. Migrants may be moving to urban areas that are almost as large as the places they have left, in which case we would expect their alcohol consumption to decline after the move.

Contagious diffusion occurs as a result of personal contact. After relocation occurs, it seems likely that drinking practices will continue to diffuse as a result of contagion. Perhaps the most dramatic example is the adoption of heavy drinking among Native Americans, a trait that, some have argued, was learned from European settlers. MacAndrew and Edgerton (1969) have argued that the Indians also learned how to behave when they were drunk from Europeans. This idea is at odds with the pervasive stereotype about Indians not being able to 'hold' their alcohol. In *Drunken Comportment,* MacAndrew and Edgerton argue that the drunkenness so often witnessed among the Indians by early settlers was merely the Indian version of what they had seen so often among the traders, trappers, and soldiers who had introduced them to alcohol. The French in Canada were the acknowledged masters in this respect. They displayed mindless drunkenness that at first repulsed the Indians, but which later was adopted with increasing zeal. The Indians learned quickly that alcohol embodied an evil spirit that would possess them whenever they were drunk. The advantage of such a spirit was that it could later be used as an excuse for whatever had happened. Alcohol offered a 'time-out' mechanism, one that the Indians could easily understand because it meshed well with their existing notions of witchcraft and possession. As one Jesuit priest wrote of the Iroquois Indians as early as 1660:

> *When our savages have received an injury from anyone, they get half drunk and do with impunity all that passion suggests to them. All the satisfaction one receives from them is embraced in two words: "He was drunk; he had lost his reason"* (Jesuit Relations *53:257; quoted in MacAndrew and Edgerton 1969).*

Alcoholism among Indians is still a major concern. As Gregory (1975) has observed, prevalence rates among Indians in Oklahoma are about five times higher than for whites. It is important to point out that there are significant inter-tribal differences. For example, Indians in the western part of Oklahoma, such as the Cheyenne-Arapaho, had a rate of alcohol-related deaths of 294/100,000 (1972-75), compared with rates of 28, 19, 10, 9, and 6 per 100,000 for the Choctaw, Chicasaw, Creek, Seminole, and Cherokee, respectively. For Indians in the last three tribes the death rates are lower than for whites living in Oklahoma (Stratton *et al.* 1978).

At a wider scale, there is compelling evidence that spatial variations in drinking practices throughout the world are shrinking (Sulkunen 1976). As Sulkunen has shown, between 1950 and 1969 there was a significant convergence toward the mean consumption level among the countries for which data were available (Table 10) and, as noted earlier, during the 1970s a similar phenomenon occurred in the United States (Table 8). The homogenization in quantities consumed has been matched by a 'leveling off' in international preferences for the three major beverage categories. This means there has been a tendency for consumers in countries favoring a particular beverage to drink more of the other beverages, often at the expense of the traditionally preferred beverage. Thus, in a 'beer' country like the United Kingdom, people are substituting other beverages, especially wine, for beer. Sulkunen (1976) has suggested that these trends are the result of intercultural diffusion at the global level. As partial explanations he suggested (1) the increase in foreign travel in the 1950s and 1960s and media portrayals of cultural differences that enabled tourists to see and copy the drinking habits of foreign countries; and (2) the concentration of alcohol production among a small number of international companies fostering international trade of alcohol.

Using the consumption data for the United States, we have tried to determine whether the 'leveling' phenomenon has also occurred here. Based on Sulkunen's data, we would expect to find that in states where a particular beverage had long been dominant, under conditions of increasing overall alcohol consumption, consumers in recent years will have substituted 'newer' beverages for the traditional beverage. In a state where spirits consumption was high in 1970, we would expect to see a relative and perhaps an absolute reduction in spirits consumption vis-a-vis beer and wine. In other words, we would expect an inverse relationship between the share of each beverage in 1970 and the change in the share of each beverage between 1970 and 1978. The results of a regression analysis confirmed this hypothesis for spirits and beer, but not for

TABLE 10 SPATIAL CONVERGENCE IN INTERNATIONAL ALCOHOL CONSUMPTION, 1950-1969

	Coefficient of Variation			
Groups of Countries	1950	1960	1965	1969
I	77.0	63.0	61.0	55.0
II	75.0	60.0	53.0	45.0
III	70.0	64.0	55.0	48.0

Group I = all countries listed in Table 6.
Group II = all European countries.
Group III = Capitalist European countries, plus USA and Canada.
Source: Sulkunen 1976:250. Copright 1976 by John Wiley & Sons, Inc. Included by permission from R.J. Gibbons *et al.*, *Recent Advances in Alcohol and Drug Problems*, Vol. 3.

		1970 SHARE			1970 CONSUMPTION			
		Spirits	Wine	Beer	Spirits	Wine	Beer	R^2
1970-78 CHANGE IN SHARE	Spirits	−0.23	★	★				0.32
	Wine	0.076	★	★				0.08
	Beer	★	★	−0.15				0.16
1970-78 CHANGE IN CONSUMPTION	Spirits				−0.00086	★	★	0.18
	Wine				★	−0.010	0.0053	0.17
	Beer				★	★	−0.0033	0.29

★ Not Significant At .05 Level

FIGURE 4 CHANGES IN ALCOHOL CONSUMPTION AND MARKET SHARES, 1970-1978 (Regression coefficients from consumption and shares in 1970).

wine (Figure 4). Thus, in the United States, there is evidence that during the 1970s drinkers in 'spirits' states shifted away from spirits, and the positive coefficient between spirits and wine shares suggests that this shift was partly made up for by an increasing share of wine consumption by 1978. In the 'beer' states there was also a shift away from beer during the 1970s. The regression coefficients between consumption levels in 1970 and changes in consumption from 1970 to 1978 also show that, in absolute terms, there was lower consumption in the preferred beverages by 1978. In other words, convergence in drinking preferences was occurring as the dominant beverages lost their grip over the alcohol market. The positive coefficient between beer and wine consumption also suggests that in 'beer' states the reduction in beer consumption was being replaced, in part, by wine. It is important to note, however, that the variance explained by the regression is low, which suggests that neither the changing level of consumption nor the changing share of the market can be predicted very effectively with the consumption and share data from an earlier time period. Presumably, there are other variables in the social and cultural realms that need to be considered (Smith and Hanham, 1982a).

At a different scale, drinking practices also appear to diffuse from person to person, a notion central to the development of the distribution of consumption model. As will be explained in greater detail in Chapter 4, this model suggests that the prevalence of alcohol-related problems is a function of the mean alcohol consumption level (Smart 1980). As per capita consumption rises, so does the proportion of very heavy drinkers and, as a result, the prevalence of alcohol-related health problems increases (Popham *et al.* 1975). This generalization has been observed empirically in a number of countries, but the model is theoretically weak. The only reasonable explanation appears to be a contagion effect at the interpersonal level. The argument goes as follows: as more alcohol is bought and consumed, its presence becomes more visible and presumably more 'normal' within the community. As an area becomes 'wetter', there are more drinking events and more places to drink. This encourages 'moderate' drinkers to drink more, and some of them become 'heavy' drinkers. In addition, for those people who are already 'heavy drinkers', the 'wetter' environment provides more socially-acceptable situations in which to drink. The contagion effect has been described by Bruun and colleagues (1975:39):

> *Mr. X, who drinks in moderation, for some reason increases his consumption of alcohol by 25 percent. . . . Like most of his friends, Mr. X is a social drinker. Because he now drinks more frequently than a year ago, the probability of his friends being offered a drink when they visit him is correspondingly increased, so that his friends' consumption level is also raised. As this process continues, Mr. X's friends may feel obliged to serve him a drink on his return visit. And so it goes on; a rising consumption affects the drinking habits of every consumer with the semblance of a spreading wave.*

At the present time little empirical evidence exists to refute or support this 'snowballing' theory of rising alcohol consumption. What was described was a contextual or neighborhood effect on drinking in which an individual's level of drinking is at least partly determined by the prevailing attitudes toward alcohol in the surrounding area. We shall examine this issue at greater length in Chapter 3.

Aspatial diffusion is attributable to causes other than relocation or personal contact. Shifting our emphasis momentarily from spatial to aspatial diffusion, there is some evidence that in recent years drinking practices among previously low-consuming population groups have been converging on the mean consumption levels for the entire population. A major concern in this respect is with women and alcohol. In general, women drink far less and far less frequently, than men. In a recent national survey, women were reported drinking an average of .13 ounces of ethanol per day, compared to .48 ounces for men. This ratio was similar for all regions except the West, where women drink more heavily (Malin *et al.* 1980). Survey data also show that in the suburbs the discrepancy between male and female drinking is less than in the total sample (Cahalan *et al.* 1969). The prevalence rate of problem drinkers was also significantly lower for women (5%) than for men (21%) in 1969. More recent surveys indicate that the male/female ratio has changed only very slightly since the late 1960s. For example, the percentage of 'moderate' women drinkers increased from 13% in 1971 to 18% in 1979, and there were fewer abstainers (NIAAA 1981a).

One of the major problems associated with using survey data to estimate drinking practices among women is that surveys of adult women are biased toward past female drinking practices. An analysis of drinking behavior among school children shows very

little difference between males and females, especially in the higher grades. Thus, although there is as yet little firm evidence that alcoholism is an increasing problem among women in the United States, the warning signs among younger drinkers are a cause for concern (Beckman 1975; Sandmaier 1980). It is also possible that drinking and problem drinking among women are seriously underestimated in self-report surveys, perhaps because heavy drinking among women is more heavily stigmatized than it is for men. It has typically been true that women are less likely than men to admit they have drinking problems, which has been reinforced by the dearth of alcohol treatment facilities for women.

In the United Kingdom, more clear-cut evidence shows that in recent years women have been drinking more, and they have become more prevalent in the data on drunkenness arrests, treatment facilities, and mortality rates (S. Shaw 1980). From the data it is not immediately obvious whether the prevalence of alcoholism among women is increasing, or whether more women are simply presenting themselves for treatment or being apprehended for drunkenness. A review of the literature suggests at least three major hypotheses suggesting that prevalence rates are increasing among women.

(1) Women are drinking more and are therefore more likely to experience alcohol-related problems.
(2) Modern women encounter more stress than ever before, in response to which alcohol-related problems have increased; and
(3) In comparison to men, women are more vulnerable to and less protected from alcohol-related problems.

Proponents of the distribution of consumption model argue that women are drinking more because the mean alcohol consumption level has risen in most countries during the last two to three decades. Alcohol is flowing more freely, so people who were light drinkers, including women, become heavier drinkers (Sulkunen 1976). As more women drink with men, for example in work settings, there is also a tendency for consumption levels to converge, which, for women, implies greater consumption (Skog 1980). Women have also been consuming more than their proportionate share of the rapidly expanding market in nontraditional beverages, including fortified wines, 'white' spirits such as gin and vodka, table wines, and low-calorie beers. It has also been suggested that as women's disposable incomes have risen faster than men's, their alcohol consumption has also risen, based on the well-established relationship between income and consumption (Popham *et al.* 1975). In some instances, the increased availability of alcohol may also have helped to bring about an increase in consumption among women. S. Shaw (1980), for example, has suggested that in Britain the prominence of alcohol in grocery stores has made alcohol simply another item on the shopping list, although in theory women should be doing less of the grocery shopping as roles continue to change. All of these trends have been complemented by an increasing proportion of alcohol advertising that is specifically oriented toward women (S. Shaw 1980).

The stress argument is based on two assumptions. First, as women enter roles that have traditionally been occupied by men, their stress levels will converge with those for men; and second, that women drink to alleviate the increasing stresses they encounter in their new roles. The prevalence of problem drinking is higher among women who work outside the home, and especially high among married women who work (NIAAA 1978). Johnson and her coworkers (1977) have investigated the effect of non-traditional sex roles on womens' drinking and the subsequent onset of problems. In

this study, a woman was defined as 'out-of-role' if she was non-traditional in any three of the following areas: (1) single; (2) divorced, separated, or widowed; (3) employed outside the home; (4) had no children; (5) was a head of household. The results suggested that there may be a relationship between employment conditions and heavy drinking. In an earlier study, Gundel (1972) had observed that many women are employed in jobs that are compatible with heavier consumption of alcohol. These jobs have what Gundel called a high 'opportunity budget' — which implies that they are either undemanding or they do not involve strict disciplines or time schedules. Work in the home or in a family business, free-lance work, and jobs associated with alcohol consumption, including waiting at tables and bartending, are examples of such occupations. Women in these positions might also encounter a 'role underload' if some of their traditional activities have atrophied, as is often the case among childless women, widows, or divorcees. If women have a high opportunity budget while working, and a vacuum in their role repertoire, they may attempt to fill in the gaps with drinking. Gundel hypothesized that in such circumstances drinking fulfills a strictly *utilitarian* role which has typically been the case for men. Such a role for alcohol is also more closely associated with problem drinking than is consumption for *convivial* or *ritualistic* purposes (Bales 1946).

Concerning women's vulnerability to alcohol, one of the most quoted facts about women and alcohol is that women run a greater risk than men of developing health-related problems when they drink. This has been demonstrated clearly for liver diseases (NIAAA 1981a; Gomberg 1976). One explanation is that, in general, women's bodies are smaller than men's and they have a lower water content. When they drink, the alcohol is less diluted and it therefore launches a more toxic assault on the body. Some recent research has questioned this long-held assumption. Johnson's (1977) study reported that even controlling for relative body weights men drink much more alcohol than women. It has been argued, however, that women may be more psychologically vulnerable to the negative effects of alcohol than men. It is possible that women face a greater risk of developing drinking problems simply because of the higher level of stigma they encounter. Drinking women may find it more difficult to have their drinking problems accepted by their families and their co-workers. In comparison, men have typically been excused for heavy drinking and even alcoholism. To be accepted for treatment, women may need to exhibit more serious symptoms than is the case for men — perhaps to overcome the general tendency to ignore symptoms or to misdiagnose them as depression or some other form of mental illness. As we shall observe, there is some evidence to support such a hypothesis.

Cultural Integration, Urbanization, and Drinking Practices

For an activity as heavily culture-bound as drinking, it is no surprise to find that variations in drinking practices among cultural subgroups have been researched extensively (Cahalan *et al.* 1969; Cahalan 1970; Greeley *et al.* 1980). Substantial differences in drinking behavior according to age, sex, ethnic background, religion, socio-economic status, and degree of urbanization have been found, but there also is substantial overlap or integration between sub-groups. For example, it is no surprise to find heavy drinking among young, single men with an Irish Catholic ancestry currently living in the inner city at the bottom of the socio-economic ladder. In comparison to the supra-cultural and psychological correlates of heavy drinking that we discussed earlier in this chapter, research with population sub-groups ('sub-structural' variables, to use

Cahalan's (1970) phrase) has a number of advantages. It is much easier to conduct because the structural variables can be identified empirically, and they remain stable over time. The results of such research may also be useful for planning purposes, because the sub-structural categories correspond to categories used by such agencies as the Census.

Of substantial interest to geographers is the apparent relationship between urbanization and both consumption levels and problem drinking. This relationship seems significant regardless of how urbanization is measured: for example, it holds for city size (Cahalan *et al.* 1969), population density (Keller and Effron 1956); and population potential (Seeley 1962). More recent analysis has produced equivocal results. The urban effect has been shown to be merely a surrogate for other predictors of problem drinking (Cahalan 1970), although an independent urban effect has been clearly demonstrated by some researchers (Smart 1980). If an independent urban influence is identified empirically, perhaps the most important subsequent step is to establish theoretical links between urban residence and heavy and problem drinking. In his early work, for example, Jellinek (1947) had suggested that the correlation between cirrhosis mortality and urbanization could be explained by the higher prevalence of medical facilities and better diagnostic techniques in urban areas. Ewing and Rouse (1978a) have subsequently argued that urban-rural differences are too great to be explained adequately in this fashion, but it is clear that the restraining influence of the temperance movement is still present in the rural areas of most countries, with the exception of France (Gushfield 1966).

In nationwide drinking surveys there is evidence of interaction effects between the influence of urban residence and an individual's age, sex, and socio-economic status (Cahalan *et al.* 1969). The groups with the highest proportion of heavy drinkers are young men (34%) and women (11%) who live in the largest cities and are in the lowest socio-economic category. The highest proportion of abstainers are older men (65%) and women (81%) living in small towns and rural areas, but they are also in the lowest socio-economic categories. Residence in an urban area is apparently conducive to heavy drinking, and the relationship can theoretically be explained in a number of ways:

(1) *A contextual explanation* — in which the prevailing attitudes in small towns inhibit and often prohibit heavy drinking, in comparison to cities, where there is less social control over drinking;
(2) *A deterministic explanation* — which implies that city life is in some way(s) more stressful or alienating than rural life, and that this might result in heavier drinking;
(3) *A selection explanation* — in which potential or actual heavy drinkers choose their residences to suit their drinking habits.

The selection explanation implies that in some cases individuals will either migrate or 'drift' into larger cities in search of greater tolerance, more anonymity, or a larger group of drinking peers. We noted earlier that the drinking habits of migrants tend to conform to those in the new residence. For example, among young men (aged 21-44 years) who moved to smaller cities than they lived in before they were 16 years old, there was a lower proportion of heavy drinkers than among men who stayed in larger cities. On the other hand, both older men and women who had moved from smaller to larger cities were more likely to be heavy drinkers. Of the young men moving from larger to smaller cities, 19% were heavy drinkers, compared with 33% for those who stayed in larger cities (population greater than 25,000). Among the older men who had moved to larger cities, 26% were heavy drinkers, compared to 10% for those who did not move. Among

young women, 12% of those who moved from small towns to larger cities were heavy drinkers, compared to 2% for those who stayed in small towns — which suggests that a greater stigma is attached to heavy drinking in women living in small towns and rural areas (Cahalan *et al.* 1969). It is possible to interpret these findings as evidence of selective out-migration, with lighter drinkers moving away from smaller places and heavier drinkers moving toward larger places. This is only the case if the change to the new level of consumption occurred before the move, which unfortunately cannot be proved from this data.

The deterministic explanation of heavy drinking in larger cities is questionable in view of an analysis of the nationwide survey data. Cahalan (1970) identified six social psychological 'risk' factors which explained far more of the variance in problem drinking than the level of urbanization. The factors included attitudes toward drinking, educational background, and environmental (family and friends) supportiveness of drinking. When these factors were held constant in a multiple regression equation, the urban effect was minimal. This implies that cities have a higher prevalence of problem drinkers because they are home to a larger proportion of 'high risk' individuals than is the case for smaller places. Cahalan's evidence suggests that this concentration appears to be the result of an overall 'climate of opinion' that allows heavier alcohol consumption in cities (the contextual explanation), rather than the effect of stressful city living conditions (the deterministic explanation). The best predictors of problem drinking among men were individual attitudes toward drinking and support for drinking from the peer group and social network members. These results support Fischer's (1976) suggestion that neither city living itself, nor some group of attributes that cluster in cities, have produced psychologically disturbed individuals who may drink to excess to obliterate the more painful parts of their existence. In other words, the existing data suggest a contextual explanation of heavy drinking rather than a psychological explanation.

For women, however, Cahalan and Room (1974) found that both urbanization and psychological variables were better predictors of problem drinking than contextual variables. Consistent with our discussion in the previous section, we suggest that as a result of prevailing community attitudes toward heavy drinking among women, there is a tendency for women to sink deeper into psychological problems before their drinking problems are recognized. For women, the deterministic explanation of heavy drinking seems most appropriate, whereas for men a contextual or selection explanation provides the best fit. Unfortunately, these conclusions confirm some of the existing sexual stereotypes about drinking, notably that men drink to be like other men, while women drink to relieve their psychological problems.

3

Alcohol Epidemiology

Many a man keeps on drinking till he hasn't a coat to either his back or his stomach.

Although there has never been a consensus in the literature that alcoholism is a disease, even hard-core opponents of the medical model accept that drinking to excess can cause disability and premature death (Szasz 1972). Because the factors that influence both drinking and the onset of drink-related problems vary across space, the study of alcohol abuse lies clearly within the domain of medical geography (Pyle 1979). The range of alcohol-related research conducted by geographers is extensive (see, for examples, Ward and McGlashan 1976; R. M. Ward and Spronz 1976; Rowley 1978; Godkin 1980; Rooney and Butt 1978; J. Ward 1975; J. S. Ward 1975 and R. M. Smith 1979). In addition several geographical studies have been conducted by non-geographers (Donelly 1978; Kilich and Plant 1981; Orcutt and Cairl 1976).

In this chapter we investigate some of the most plausible explanations of alcoholism, beginning with a discussion of the disease concept and its alternatives. Building from our investigation of etiological theories, we then attempt to describe major categories of drinking habits, with a particular emphasis on the results of surveys that have assessed the prevalence of problem drinking and alcoholism within the population. From a more specifically geographical perspective, we then look at some of the attempts to estimate spatial variations in alcoholism rates in the United States. In a final section we look at some of the contextual effects on drinking, in an attempt to explain why some people choose to drink heavily while others abstain. As we shall see, spatial variations in abstention rates appear to play an important role in the causes of problem drinking.

The Disease Concept of Alcoholism

The idea that alcoholism is a disease has surfaced on numerous occasions during recent centuries, beginning as early as 1785 with Benjamin Rush's work in the United States and Thomas Trotter's in Scotland. In spite of these early attempts, it was not until 1958 that the American Medical Association officially recognized alcoholism as a disease. Until that time the disease concept had come and gone . . . "like a will-of-the-wisp, leaving no lasting impression and making little if any contribution to the understanding or control of the problem" (Howland and Howland 1978:40). The new respectability of the disease concept was largely a result of E. M. Jellinek's work as the first

director of the Center of Alcohol Studies at Yale University (Jellinek 1952, 1960). Jellinek was never certain whether addiction to alcohol was psychological or physiological, but his ideas were adopted by many in the medical profession. Gradually, by adding to a base of common knowledge, the disease concept evolved toward a set of generally-agreed-upon propositions (Pattison 1976):

(1) *Alcoholics and non-alcoholics are significantly different* — the differences are either inborn or developmental, and they produce fundamental changes in the biochemical, endocrine, or physiological systems of the alcoholic.
(2) *Alcoholics develop an allergic reaction to drink* — which results in a craving, inability to stop, and a loss of control over the use of alcohol.
(3) *The disease process is irreversible* — it progresses inexorably toward chronicity and death. Alcoholism can be arrested by abstention, and be held in remission, but it can not be cured.
(4) *The alcoholic is not personally responsible for his affliction* — alcoholism is a disease for which a person would neither be blamed nor punished by society; the alcoholic has a right to be treated.

In sharp contrast to other drugs, the abuse of alcohol is traditionally viewed as a problem of 'bad' or 'sick' users, rather than a 'bad' substance. Alcohol policy since Prohibition has been based largely on the notion that a minority of alcohol users are unable to control their drinking. Consequently little or no attempt is made to limit the availability of the substance (Beauchamp 1980; see also Chapter 4). The disease concept has given the alcoholic a much better deal than its precursors which had defined the alcoholic as a pathetic sybarite, a sinner, or a criminal. The disease concept has survived and grown in stature, according to one observer, because:

> *it fits into the Zeitgeist of the Protestant ethic and into the microbe-hunter's age of medicine . . . (and) . . . because of a well-intentioned motive to use the prestige of the medical profession in attempting to bring about better treatment of those with alcohol problems (Cahalan 1970:5).*

Critics of the disease concept have argued that the propositions on which it is based have not been, and can not be, validated empirically, especially the 'loss of control' notion and the bi-polar definition of alcoholics and non-alcoholics (S. Shaw *et al.* 1978). In addition, the medical concept of alcoholism in many instances has not been beneficial in a treatment sense, because it tends to give the individual a cast-iron alibi. The alcoholic learns that he is sick and that he cannot do anything to change himself (Pattison, 1976).

In the last two decades it has become fashionable to look for alternatives to the disease concept, particularly those that involve environmental and ecological explanations of alcoholism (Harford 1979). Many people have argued that instead of conducting a head-count of alcoholics, it is more useful to assess the prevalence of specific problems associated with drinking. In this way it is possible to replace the label *alcoholic* with a non-connotative emphasis on the *behavior* that results from heavy drinking (Plaut 1967). A problem drinking approach allows more emphasis on the environmental and social contexts of drinking, rather than attributing blame solely to the individual or his addiction to alcohol. By freeing the alcoholic from the stranglehold of

the medical profession, problem drinking becomes a collective responsibility to be shared by public health and treatment agencies, in addition to the drinker's family and his work environment.

The first large-scale attempt to apply the problem drinking concept empirically was by Cahalan (1970), who collapsed 75 items into eleven problem areas associated with drinking. Cahalan concluded that 15% of the men and 4% of the women in the United States had experienced two or more serious problems related to drinking in the three years before the survey; further, 28% of the men and 17% of the women had experienced one of the eleven problems (NIAAA 1971).

The problem drinking approach, as an alternative to the disease concept, has been controversial. It has been attacked by medical practitioners for the arbitrary nature of its cut-off points, the questionable validity of the scales used in the drinking surveys, and changing individual problem scores from one time to another (Edwards *et al.* 1977). Cahalan (1970) anticipated such criticisms when he noted that the major uses of the problem drinking surveys are to quantify and to compare approximate prevalence rates for sub-groups of the population, and to establish the social and psychological correlates of problem drinking that are amenable to change through preventive measures. If the data help to identify the causes of problem drinking, everyone will benefit; but as with most public health research strategies, a precise etiology was not anticipated. On balance, it seems fair to view the 'problem drinking' concept as a complement to, rather than a replacement for, the disease model, although as we shall see in Chapter 4, it is the latter that still dominates alcoholism treatment programs.

Etiological Models of Alcoholism

Common sense suggests that alcoholism and problem drinking have multiple causes, most of which can be discussed in the context of the tripartite public health model of agent, host, and environment (Siegler *et al.* 1968).

Agent Models attribute alcoholism primarily to the consumption of alcohol. This statement may sound trivial, but we should remember that although most people drink, almost 90 percent experience no serious alcohol-related problems. In spite of this, at various times and in many different countries, alcohol has been denounced as an evil substance from whose grasp many cannot escape (Tongue 1978; Howland and Howland 1978). The only solution for those at the mercy of alcohol is *abstinence*, and for the society as a whole, *prohibition*. In modern times, a more balanced view has become popular, the *distribution of consumption* model (Smart 1980; Bruun *et al.* 1975). The model is based on the observation of a clear-cut empirical relationship between the mean level of alcohol consumed in a society and the prevalence of drink-related problems, particularly cirrhosis of the liver (see Chapter 4).

Host Models of alcoholism suggest that the major etiological factors lie within the individual, and alcoholics are considered to be significantly different from the rest of the population in one or more ways. A *moral* model depicts the alcoholic as a 'willful sinner' (Tarter and Schneider 1976), in contrast to the *medical* model. The source of the disease within the medical model is hotly disputed: some think it is a glandular disorder (Noble 1973); others suggest a brain dysfunction, a nutritional abnormality, or an allergy. Currently, there is considerable support for genetic (Shields 1977; McClearn 1973) and metabolic explanations (Walsh 1973). Still under the umbrella of the host models are *psychological* models of alcoholism, which are equally eclectic in range (see, for example, Orford 1977; Roebuck and Kessler 1972).

Environmental Models are more interesting to the geographer because they imply causal links between problem drinking and spatially variant phenomena. These models have also become more respectable as a result of the national surveys of drinking practices, one of which concluded that "whether a person drinks at all is primarily a sociological and anthropological variable rather than a psychological one" (Cahalan *et al.* 1969:200). In the absence of consensus or any convincing etiological explanations from the medical and psychological camps, environmental explanations have become increasingly popular in recent years (Roebuck and Kessler 1972; Harford 1979). As described in Chapter 2, numerous attempts have been made to outline macro-level cultural or social organization models of drunkenness. One of the most enduring and flexible of these is the *social integration* model (Heath 1980), which is currently offered as the major alternative to the consumption model. Proponents of this model argue that drinking problems result primarily from the mysticism associated with alcohol, guilt following its use, and conflicting messages resulting from the ambiguous rules governing its consumption (Ullman 1958; Blacker 1966).

At a less ambitious level there have been numerous attempts to uncover some of the sub-structural correlates of problem drinking, which seek to explain variations in prevalence using the traditional *epidemiological* categories of age, race, sex, socio-economic status, occupation, and religion. As a direct result of the nationwide surveys of drinking practices, other models have appeared. One is a *social-psychological* model in which problem drinking is explained by the interplay of contextual variables that either encourage or prohibit heavy drinking and psychological variables that make drinking a desirable or unavoidable practice (Cahalan 1970; Cahalan and Room 1974). The survey data also partially support a *societal reaction* or 'labeling' theory of alcoholism, in which an individual's drinking behavior is labeled as deviant according to local norms and situational variables, including the visibility of deviant acts and the individual's social status (Scheff 1966; Pittman and Gordon 1958).

For most medically-oriented tastes, the environmental models are too speculative and untestable, while the environmentalists criticize the medical and psychological models for ignoring the obvious importance of a lifetime of interactions between individuals and their socio/cultural milieux. One solution is to synthesize from the available literature and opt for a multi-causal model, in which an alcoholic or a problem drinker is thought of as:

> *An individual who: 1) responds to beverage alcohol in a certain way, perhaps physiologically determined, by experiencing intense relief and relaxation, and who 2) has certain personality characteristics, such as difficulty in dealing with and overcoming depression, frustration, and anxiety, and who 3) is a member of a culture in which there is both pressure to drink and culturally induced guilt and confusion regarding what kinds of drinking behaviors are appropriate (Clare 1977:76).*

Drinking Categories: Attempts to Estimate Prevalence

Nationwide surveys report that between 30 and 40 percent of the American adult population abstain completely from alcohol (NIAAA 1981a). Considering that close to 90% of college-aged individuals and 75% of high school students say they have tried alcohol at least once, we can conclude that after their first contact with alcohol many

people choose never to drink again in any quantity. Blane and Hewitt (1977) found that the proportion of youths who have contact with alcohol has increased from 50% for males and 32% for females in the 1930s, to 89% and 85% in the mid-1970s (NIAAA 1978:44). A recent New York Times survey of 1066 high school students in grades 10 and 11 found that 80% drank alcohol at least 'occasionally.' Those who continue to drink may move into one of several phases, beginning with experimental drinking, in which an individual tests his or her capacity and tries out different beverages (van Dijk 1979). Some may progress to integrated drinking, which generally conforms to societal norms. Some experimental drinkers will leap-frog this stage or move through it rapidly on their way to excessive drinking, where the habit begins to have some adverse effects. The options from this point are to stop drinking, to stablize consumption and return to one of the earlier phases, or to increase consumption, eventually shifting into the final stage of addiction or alcohol dependence, in which drinking has become more important than anything else.

This account is highly simplified, but the idea of alcoholism as a disease that progresses through a series of identifiable phases has pervaded the literature, mainly as a result of Jellinek's (1952) work. The irreversible and linear progression toward chronic alcoholism is an attractive medical analogy. As Cahalan (1970:4) has observed, it is ". . . of a piece with Hogarth's famous illustration of a drunkard's progress on the downward path to perdition," but the evidence suggests that the idea of an orderly progression is exaggerated. Most drinkers continue to drink at a level they find comfortable, without experiencing any problems; and there is evidence that many people move back and forward from one category to another. In surveys conducted in the middle 1960s, 37% of the population said they currently drank considerably less than they used to, and 20% said they drank less. Of the 32% who were abstainers, 22% said they had never drunk at all, but 10% had been drinkers at some time. In sum, the data show considerable turnover between the consumption categories. Fifty-one percent of the total sample (67% of the men and 38% of the women) said they had changed their drinking habits sometime prior to the survey (Cahalan *et al.* 1969).

Although it may only be useful for illustrative purposes, it is possible to estimate the percentages of the population in each of the categories that have been outlined. Using the estimates from a number of nationwide surveys on drinking and a number of demographic and epidemiological models, NIAAA has recently attempted to chart the careers of problem drinkers among a hypothetical population of 10,000 adults (Malin *et al.* 1980a; Figure 5). It was estimated that at the beginning of the year 546 people have alcohol-related problems serious enough to warrant treatment, and another 27 will become new cases during the year. Of the original 546, only 85 (16%) actually enter alcohol treatment programs, and 46 (54%) of these will return to problem drinking during the year, leaving 39 in remission. The majority of problem drinkers (461, 84%) never seek help of any type, although the size of this group will probably vary substantially from one place to another.

In the preceding discussion, survey data were used to assess the prevalence of problem drinking within a population, but in the early years of research in the field of alcohol abuse, the only source of data easily available for this purpose was mortality data. Jellinek (1942) appears to have been the first to attempt to assess the prevalence of alcoholism. In 1940 he calculated it to be 11.6 per 100,000, based on his observations of deaths that could be directly and indirectly attributed to alcohol. No attempts were made to use other data sources, or to predict the prevalence of other alcohol-related problems such as morbidity, arrest rates, hospitalization, accidents, or crimes.

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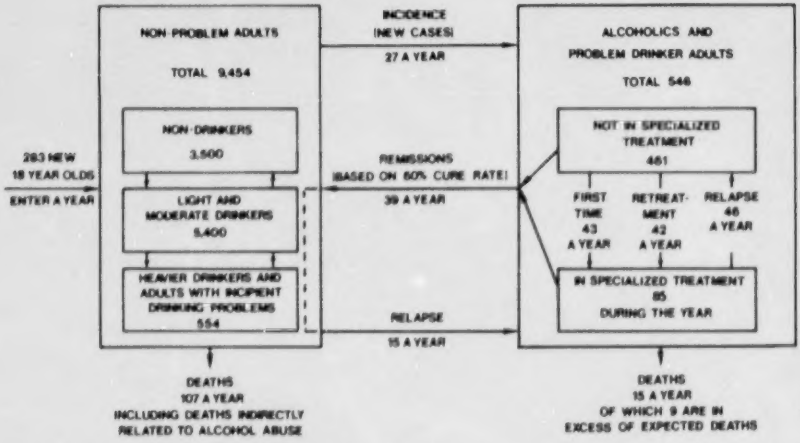

FIGURE 5 THE DYNAMICS OF DRINKING AND PROBLEM DRINKING (From Malin *et al.* 1980).

As a constant innovator in the field, Jellinek invented a formula to estimate the prevalence of alcoholism. He had observed a stable and positive relationship between the consumption of alcohol and liver cirrhosis mortality. From autopsy reports of alcoholism deaths, he was convinced that a constant percentage of all cirrhosis deaths could be attributed to alcoholism. The Jellinek formula was:

$$A = (PD/K)^R$$

where:
- **A** = the total number of alcoholics alive in a given period;
- **D** = the number of reported deaths from liver cirrhosis;
- **P** = the percentage of those deaths attributable to alcoholism;
- **K** = a constant representing the % of all 'alcoholics with complications' who died of liver cirrhosis; and
- **R** = the ratio of all alcoholics to those with complications

In the early years the formula produced prevalence figures which, after extensive field research, appeared to be reliable. As time went on, however, the formula seemed to be less accurate, which suggested that the parameters needed to be changed. Many researchers have used the formula, either in its original format or with some modifications. For example, Keller and Guiroli (1976) estimated that there were 5.75 million alcoholics in the United States in 1975. From these calculations it is also possible to measure *incidence rates,* new cases occurring within a given time period. Keller (1975) estimated that about 0.5 million persons became alcoholics in 1972, replacing a somewhat smaller number of existing alcoholics who either died or recovered. Keller suggested that the new alcoholics probably came from the ranks of the 'problem drinkers' at a rate of about 9% per year — in other words, one in 11 'problem drinkers' becomes an alcoholic each year, which is about 0.5% of all drinkers.

The geographical pattern of Jellinek-type estimates are shown for 1975 in Figure 6. These figures were prepared by Coakley and colleagues (1978) using the following estimates for the Jellinek parameters: P(men) = .628; P(women)=.216; K=.01079; R=5.3. With these parameters the number of alcoholics was estimated to be 7.57 million (over 21 years). Keller's (1975) lower estimate of 5.5 million was calculated using the parameters that were originally applied in the 1940s. The highest rates of alcoholism are in the southwestern and northeastern states, and certain states in the Midwest and Great Lakes regions (and Florida). The lowest rates are in the southern and Great Plains states. In some ways the Jellinek map is similar to the beverage preference map shown in Figure 3. This suggests that alcoholism, as estimated by the Jellinek formula, is lowest in those states where beer is preferred to spirits or wine, and highest where wine is preferred to beer. This conforms to the general hypothesis that beer is 'safer' to drink because, by volume, it contains less alcohol than spirits or wine. It is also apparent that the Jellinek map is similar to the consumption map (Figure 2). Neither of these observations is surprising when we consider that the major determinant of the Jellinek rate is liver cirrhosis mortality, which is strongly and positively correlated with alcohol consumption (Schmidt 1977; Terris 1967).

The Jellinek estimates of alcoholism are much lower than most of the survey-based estimates of 'problem drinking', which vary from as high as 18 million 'heavy drinkers,' to 7.2 million 'alcoholics abusers' (Table 11). Obviously the prevalence rate

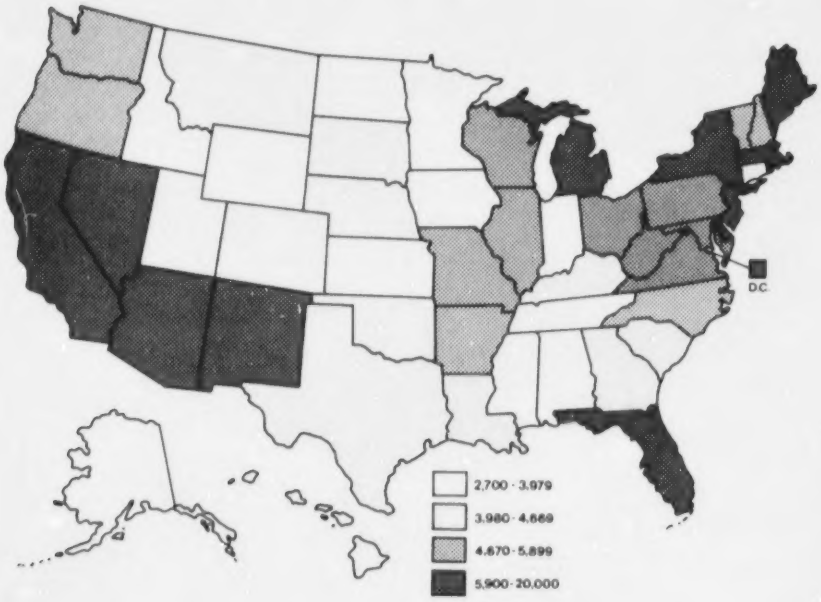

FIGURE 6 ESTIMATED ALCOHOLICS PER 100,000 ADULTS. Estimated alcoholic rate in 1975 population 21+ years using the Jellinek formula based on data in Coakley *et al.* 1978).

will vary depending on the methods used, but at least part of the discrepancy is accounted for by the presence, within the large estimates, of 'problem drinkers' who are not yet, but may soon become alcoholics (Coakley and Johnson 1979).

The NIAAA is currently developing a new method for estimating linear changes in the incidence and prevalence of alcohol abuse (Coakley and Johnson 1979). The estimating model is:

$$P = D \cdot E(t) + \frac{\Delta E(t) \cdot [E(t) + 1]}{2}$$

where: **P** = prevalance, defined as alcohol abusers who would be accepted for treatment;
D = total deaths per year among alcohol abusers;
E(t) = expected lifetime as an alcohol abuser (assumed as 20 years);
Δ = constant linear change in incidence per year.

Using this model, which is more broadly based and dynamic than Jellinek's, the total prevalence of alcohol abusers in 1974 was estimated to be 7.0 million (4.4 million men and 2.6 million women); in 1975 the prevalence was estimated as 7.2 million; the incidence rate during 1974 was inferred to be 500,000 (Coakley and Johnson 1979).

TABLE 11 PREVALENCE ESTIMATES FOR PROBLEM DRINKING AND ALCOHOLISM IN THE UNITED STATES

Source	Population (Definition)	Total Number	Male	Female
Chambers and Griffey 1975 *Survey-Based Estimate*	Heavy Drinkers[a]	18 million[b]	13,860,000	4,140,000
Johnson *et al.* 1977 *Survey-Based Estimate*	Problem Drinkers[c]	14.4-9.3 million (1975)[d]	10,562,250 to 7,041,500	3,843,500 to 2,306,100
Cahalan and Cisin 1976 *Survey-Based Estimate*	Problem Drinkers[e]	13.7 million (1975)[d]	9,858,000	3,843,500
Keller 1975 *Jellinek 'Plus' Estimate*	Problem Drinkers and Alcoholics	9.5-10.5 million (1972)	NA	
Summary of State Plans 1976 *NIAAA Estimates*	Alcohol Abusers and Alcoholics	9.7-10.3 million (1975)	NA	
Creative Socio-Medics 1977 *Flow Model Estimates*	Alcohol Abusers[f]	7.0 million (1974)	4,400,000	2,600,000
		7.2 million (1975)	4,500,000	2,700,000
Keller and Gurioli 1976 *Modified Jellinek Estimate*	Alcoholics	5.75 million	4,800,000	950,000

[a]Persons who drink every day, often 5-6 drinks at each sitting.
[b]Based on U.S. population aged 14 and over.
[c]Problem drinking index defined by combining scores on a symptoms and consequences of problem drinking scale with a quantity-frequency index of consumption.
[d]Based on U.S. population aged 18 and over (1975).
[e]Problem drinkers are persons with a high number of alcohol-related problems (see text).
[f]Alcohol abusers are persons whose drinking has progressed to the point where they would be accepted by a treatment facility with a diagnosis of alcoholism.
Source: Coakley and Johnson 1979:5.

Another way to produce prevalence estimates, again based on alcohol-related mortality rates, has been described by Wilson (1979) and Wilson and Ratledge (1980) in reports prepared for NIAAA. This technique uses what is referred to as synthetic estimation to calculate the prevalence of alcoholics or alcohol abusers. The data for seven alcohol-related mortality rates were collected for each county in the United States. A factor analysis revealed two independent factors: (1) *an alcohol casualty index* — with the highest loadings on deaths from automobile accidents, alcoholism, and suicide; and (2) a *chronic health index* — with the highest loadings on liver cirrhosis deaths, alcohol poisoning, alcoholism, and homicide. The spatial estimation technique involves first determining the demographic and socio/economic characteristics that correlate most strongly with the two indices, then attributing a standardized score to each county based on its scores on those characteristics. Counties with high scores are thought to be those most likely to generate high rates of alcohol-related problems. For illustrative purposes we have listed the ten counties with the highest scores, and some additional data describing the demographic and socio/economic variables that were highly correlated with the two alcoholism indices at the aggregate level (Table 12). As one might expect from a global, synthetic estimation technique, the counties are very different from one another; with two exceptions, they have a high proportion of either Native American or Spanish American residents, or both. Most of the counties also have chronically high unemployment rates and some exhibit characteristics of family and community instability. The two exceptions of Suffolk City in Virginia and Storey County in Nevada, both of which have unique and highly localized circumstances that are conducive to heavy rates of alcoholism.

At least one attempt has been made to produce synthetic estimates of alcoholism that are based on behavioral indicators rather than on mortality rates — the Alcohol Consumption and Consequences Index (ACCI; see Malin *et al.* 1978). Two indicators were used: *frequent heavy drinking* — five or more drinks at least once a week; and *current tangible consequences* — a cumulative score on a range of alcohol-related problems (Figure 7). The authors used Automatic Interaction Detection (AID) to pinpoint the socio/economic and demographic variables most closely associated with the two behavioral indices. They then calculated state-wide prevalence rates. The resulting geographical pattern is similar to that illustrated in the other maps, but four of the states in the West-South-Central region are included in the highest prevalence category (Texas, Oklahoma, Arkansas, and Louisiana). We know from Chapter 2 that this region is not among the 'wettest' in the country. The Jellinek and mortality-based maps show that alcohol-related deaths in these states are not in the highest category. It is possible, then, that the residents of these states may encounter unexpectedly and unpredictably high rates of problem drinking. Although at this level of analysis we must be extremely cautious when jumping to etiological conclusions, we have reason to suspect that problem drinking may be at least partly related to the social and cultural context in which heavy drinking occurs. In the final part of this chapter we shall investigate this possibility further.

Contextual Effects on Drinking Behavior

Alcoholism prevalence data give rise to at least three important questions about drinking practices. First, why do individuals start to drink heavily and continue long after the onset of significant problems? Second, why do so many individuals choose to

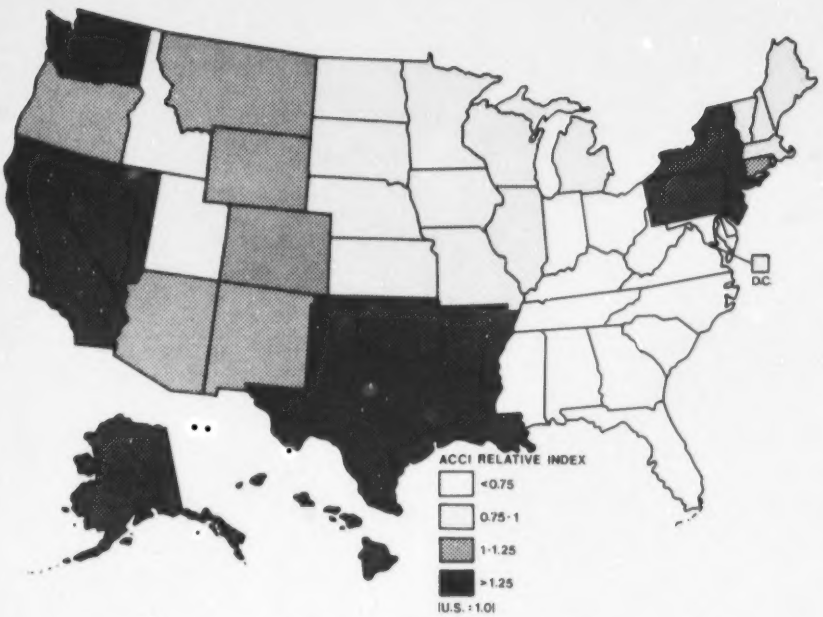

FIGURE 7 ALCOHOL CONSUMPTION AND CONSEQUENCES INDEX (ACCI) (From Mahlin *et al.* 1978).

abstain in a culture that allows and even encourages at least moderate drinking? Third, what is the relationship between the abstention rate in a locality and the prevalence of problem drinking?

The Genesis and Maintenance of Heavy Drinking

To explain why an individual, after first experiencing alcohol, increases his or her consumption until it reaches a dangerous level, requires a multi-causal approach. At the individual level the following circumstances are typical of the progression toward heavier drinking: a person suffers some intensive emotional pain; he finds that alcohol brings temporary relief; and whenever the pain returns he drinks again to find relief (Johnson 1973).

At a societal level, becoming a problem drinker may involve several steps (Cahalan 1970). First, the local culture must permit drinking and, at least occasionally, heavy drinking. Second, the individual may continue to drink according to the local norms prescribed for his age, sex, ethnic or social-class grouping. Third, the individual may then graduate into, 'age out' of, or migrate toward an environment that is less permissive than the first, so that the drinking level will be defined as heavy in comparison to local norms. Fourth, the individual may continue drinking in spite of local disapproval, if drinking provides powerful reinforcement and substantial short-term gratification. Finally, the individual may separate himself from this family, friends, and work associates, who are the only people able to exert a controlling influence on his drinking.

Cahalan's observations are based on the results of nationwide surveys of drinking practices, but they cannot fully explain why an individual continues to drink heavily even after he begins to encounter social, economic, legal, or medical problems. A simplified explanation is offered by Van Dijk (1979), who suggests that drinking is influenced by a series of feedback loops, or 'vicious circles,' which represent a set of overlapping and interacting forces:

(1) *The pharmacological circle.* As a result of increasing tolerance, the individual needs to drink ever greater amounts of alcohol to reach the desired stage of euphoria. In fact, in the later stages he or she has to drink a substantial amount just to reach the level at which drinking used to begin — a phenomenon usually referred to as 'drinking to feel normal' (Johnson 1973).
(2) *The cerebral circle.* At extreme levels, prolonged drinking, perhaps accompanied by a nutritional deficit, may result in some brain damage and related physical problems. The effect would be to weaken the ego of the drinker, which could interfere with his capacity to regulate consumption or control its subsequent effects.
(3) *The psychological circle.* Heavy drinkers may find that the euphoria associated with drunkenness is increasingly attractive, especially as a way to solve or forget everyday problems, and also as a cure for withdrawal symptoms. The heavy drinker learns quickly that the effects of depression, hangovers, and shakes can be reduced by continued drinking. In addition, drinking erases the bad memories of past hangovers and helps the individual forget his shame about not being able to stop drinking (Cahalan 1970).
(4) *The social circle.* Eventually, as a result of family quarrels, poor performance at work, and a range of economic, social, or legal problems, the heavy drinker either finds himself alone, or solely in the company of other heavy drinkers. He has essentially separated himself from the only social ties that might have been able to help him reduce his drinking. His social and spatial activities are now centered on drinking.

The evidence available in surveys is consistent with this description of alcoholic careers as a set of overlapping vicious circles. As drinkers push themselves inexorably toward dependence on alcohol, they explain their drinking in different ways. In a recent study of military personnel, for example, Holcomb (1982) asked the respondents to list their reasons for drinking. Occasional drinkers said they mostly drank to relax; to be with friends; to unwind; to overcome depression; and because they went to a lot of parties. For dependent drinkers in the sample, these social and environmental reasons were not among the most frequently cited. The results of the survey suggest that as alcohol becomes more important to the individual, drinking occurs primarily for personal rather than social reasons. A study conducted by Pelc and Verbanck (1979) found some similar differences even among a sample of alcoholics, with those in the early phases of heavy drinking more likely to drink in social settings. Alcoholics in the later phases, in fact those being admitted for detoxication, reported that their drinking was habitual and solitary, and primarily a means of avoiding problems and tolerating withdrawal symptoms.

TABLE 12 U.S. COUNTIES WITH THE HIGHEST ALCOHOL-RELATED MORTALITY RISKS[a]

Counties (in order)[b]	Selected Socio/Economic and Demographic Variables						
	% Native American	% Spanish American	% Unemployed	% Vacant Housing	% Low Occupational Status	% Children Not Living With Family	% Males Divorced
1. McKinley, NM	61.9	20.0	6.6	7.7	38.7	28.7	4.0
2. Shannon, SD	87.0	0.0	13.0	20.5	48.3	35.5	6.0
3. Sioux, ND	50.8	0.0	10.5	12.1	29.8	28.2	5.5
4. Suffolk City, VA	0.3	0.4	6.5	7.3	36.2	34.2	5.8
5. Todd, SD	0.1	0.1	13.5	16.9	29.9	32.6	6.0
6. Storey, NV	1.6	2.1	1.3	24.7	37.1	19.3	13.6
7. Apache, AZ	74.7	7.4	8.8	14.4	41.6	25.4	2.6
8. Glacier, MT	42.7	0.5	12.6	10.1	35.9	21.4	4.6
9. Rio Arriba, NM	11.8	82.2	9.4	13.1	41.9	18.8	2.5
10. Guadalupe, NM	0.3	84.5	5.2	18.1	52.1	19.4	3.0
U.S. Mean	1.2	4.7	4.4	6.1	36.0	17.4	4.2

[a]High risk implies that the county has a high-risk combination of the socio/economic and demographic variables that are most highly correlated with the alcohol mortality indices (Wilson and Rutledge, 1980).

[b]Alaska and Hawaii were not included.

Source: Adapted from NIAAA 1981b.

The Ecology of Abstinence

The proportion of abstainers in the population varies from one survey to another. In 1969 Cahalan and his colleagues reported that 32% of the population were abstainers, but later estimates range from as high as 38% to as low as 26% (NIAAA 1981a). The first question that arises from the survey data is why do so many people choose to refrain from what amounts to a national pastime?

The reasons people give for not drinking are predictable. The most frequent response is an objection based on moral or religious grounds, which explains why abstainers are typically concentrated among the conservative Protestant denominations. For men, the most important reasons for not drinking are health-related; for women, personal reasons, such as not liking or needing alcohol, are more common. The data in Table 13 show some spatial variations in the reasons people give for not drinking. Abstainers in the two northeastern regions of the United States are more likely to explain or justify their choice as a personal preference than they are in most other parts of the country. Correspondingly, only a few northeasterners mention moral or religious beliefs as reasons for their abstinence.

Because of the importance of health-related reasons for abstaining, we would expect to find that alcoholics and heavy drinkers experience more health problems than abstainers. In general, mortality rates among alcoholics and heavy drinkers are higher than for the population as a whole. Bruun and colleagues (1975), for example, found that the ratio of observed to expected mortalities for alcoholics varied from 1.7 to 6.5, with most studies reporting a ratio greater than 2.0. It is surprising to note, however, that mortality rates among abstainers are higher than among moderate drinkers — which gives some credence to the belief that moderate drinking is beneficial (Ewing 1978; Klatsky *et al.* 1981a, 1981b). Ewing (1978:41) offered another explanation:

> *Possibly being an ardent abstainer is associated with a particular psychological set and style of life which combine to produce certain tensions which are themselves basically unhealthy.*

Perhaps the most publicized reason for drinking is to benefit from its tension-reducing properties. Although the survey data reported by Holcomb (1982) support this, no convincing empirical evidence exists that alcohol actually reduces tension substantially (Cappell 1975). Recent studies suggest that the tension-reducing properties of alcohol are predominantly cognitive — in other words people who expect alcohol to relieve their tension experience a positive effect, even if they do not actually drink any alcohol (Marlatt and Rohsenow 1980).

It is also not clear whether abstainers are more satisified with their lives than drinkers. In most of the drinking surveys, respondents are asked to relate their psychological 'ups' and 'downs' to their drinking histories (Cahalan *et al.* 1969). Most respondents report that their life situations are less harmonious when they are drinking, but it is possible that the results from such studies are biased by the respondents' perceptions about the negative aspects of drinking. A recent study conducted by Hingson and collaborators (1981) found almost no relationship between abstaining and higher life satisfaction, and in fact the authors suggested that drinking may help to reduce some of the problems that otherwise would worsen the quality of an individual's life.

TABLE 13 MAJOR REASONS FOR ABSTAINERS NOT DRINKING (percentages[a])

Group	Total Number	Religious or Moral	Don't Care For It	No Need or Desire	Bad for Health	Exposed to a Bad Example in the Past	Brought up not to Drink	Financial Reasons
Total Abstainers	898	31	26	26	20	20	19	12
Men	268	26	21	22	27	15	12	18
Women	630	33	28	28	16	22	23	9
Region								
New England	36	3	17	22	10	11	11	7
Middle Atlantic	93	6	26	18	15	11	10	3
South Atlantic	149	40	24	23	20	11	20	11
East South Central	158	42	16	28	16	21	27	10
East North Central	158	24	25	26	28	20	18	14
West South Central	95	38	38	23	18	31	16	12
West North Central	83	22	26	33	9	24	23	10
Mountain	37	55	16	23	9	34	20	19
Pacific	88	32	29	18	21	13	11	18
Religion								
Conservative Protestant	633	40	23	26	16	20	21	11
Liberal Protestant	85	32	34	34	31	23	38	18
Catholic	130	4	35	29	30	21	10	12

[a]Totals to more than 100% across the rows because some abstainers gave more than one reason.
Source: Adapted from Cahalan *et al.* 1969:119-120. Reprinted by permission from Journal of Studies on Alcohol, Inc.

It is difficult to speculate on this issue without further data, but to pursue a related theme we have analyzed some data from a survey in Oklahoma which suggest that the relationship between drinking level and life satisfaction may be at least partly dependent on the larger spatial context in which drinking occurs. The results of a household survey of 2,638 households in Oklahoma indicated that more than half of the respondents were abstainers (57.7%). Compared with the national average abstention rate of 32%, it is clear that Oklahoma is a 'dry' state, as are many other southern and Great Plains states. Although the questions about life satisfaction were asked independently of the questions about drinking, the survey results show that in general abstainers are significantly more satisfied with their lives as a whole, and with most of the traditional life domains, than are the respondents who drink. This result may reflect a tendency for life satisfaction to be related to the local cultural norms about drinking. It is plausible that in a 'drier' area, like Oklahoma, abstainers may be more satisfied about their decision to abstain because it is a majority decision. In 'wetter' regions, for example in the Boston area where the Hingson (1981) survey was conducted, the choice to abstain is a minority decision. Non-drinkers may find that in a 'wet' environment their social options are considerably reduced. Another possible explanation for the relationship between abstinence and life satisfaction in the Oklahoma sample is that the drinking/non-drinking variable is a surrogate for another variable that also predicts higher levels of satisfaction. The obvious candidate here is a person's religious beliefs. In general, adherents to the fundamental denominations, and majority of the abstainers, are more satisfied with their lives than adherents to the more 'liberal' denominations (Shortridge 1976). Although very little work on this topic has been conducted, Ewing and Rouse (1978b) noted that religion alone does not fully explain the high levels of abstinence in the southern states. When they controlled for the influence of religion, they found that significant regional differences in the percentage of abstainers remained.

The spatial pattern of abstinence in the United States is also predictable, based on the consumption levels described in Chapter 1 (Table 1). The East South Central region has more than twice as many abstainers than the mean for the whole country (65% compared to the national average of 32%), and above-average abstention rates also occur in the South Atlantic region (42%), the West South Central (38%), and the Mountain region (42%). There are proportionately fewer abstainers in metropolitan areas, and again as expected from the consumption data, fewest of all in suburban areas (Table 14). The data for adults is confirmed by the result of a recent *New York Times* survey conducted among teenagers. In the suburbs only 14% of the 10-12th graders who were interviewed said they never drank any alcohol, compared with 23.3% of the students living in the New York City school district.

Local Abstention and the Prevalence of Problem Drinking

The data suggest that at both the regional and the community levels, a contextual effect influences individual drinking practices. As one might expect for an activity that is largely social in nature, the contextual effect on drinking may be strongest at the local level. Cahalan and Room (1974) were able to cast some light on this issue by identifying 'wet,' 'medium,' and 'dry' neighborhoods among the 100 interviewing localities in their national survey. When the neighborhood types are cross-tabulated with region and community size, the larger scale variables add little to the effect of the neighborhood's 'wetness' or 'dryness.' By definition, abstainers are not very common in the wet

TABLE 14 ABSTENTION AND URBANIZATION (percentages)

Population and Place of Residence	Total Number	Abstainers	Infrequent Drinkers	Light and Moderate Drinkers	Heavy Drinkers
		SMSAs			
Central Cities > 1,000,000	260	21	16	45	18
Central Cities, 50,000-1,000,000	554	26	14	44	16
Suburbs (outside Central Cities, 50,000-1,000,000)	189	13	15	60	12
Cities, 2,500-49,999	422	17	16	50	17
Nonfarm under 2,500	297	31	18	44	7
		Non-SMSAs			
Cities, 2,500-49,999	372	37	12	40	11
Nonfarm under 2,500	466	52	12	28	8
Farm	186	57	15	23	5
Total	2,746	32	15	41	12

SMSA: Standard Metropolitan Statistical Area

Source: Cahalan *et al.* 1969:40. Reprinted by permission from Journal of Studies on Alcohol, Inc.

neighborhoods regardless of community size or region, while they are in abundance in dry neighborhoods (Table 15). In the 'medium' neighborhoods there are more abstainers in the cities of 'wet' regions than in the rural areas (14% as opposed to 7%), but this is reversed in the 'dry' regions (10% versus 22%). This suggests that norms about drinking and subsequent drinking behaviors vary more in cities than in smaller towns and rural areas. Moderate drinking is consistently lowest in the cities, regardless of how wet the neighborhood is, which also suggests that the greatest extremes of drinking behavior occur in cities.

In the cities of both 'wet' and 'dry' regions heavy drinking varies directly with the 'wetness' of the neighborhood (0% in dry neighborhoods, 24% in medium neighborhoods, and 30% in wet neighborhoods in the 'wet' regions; and 12%, 26%, and 39%, respectively, in the 'dry' regions). This suggests the existence of a culture of 'wetness' in urban areas that is largely independent of region, which apparently is the case in the 'wet' cities of the South: New Orleans, Atlanta, and Houston. In the rural areas these findings are reversed, and the heaviest drinking is most prevalent in the 'drier' neighborhoods. In the 'wet' regions, for example, 18% of dry neighborhood residents are heavy drinkers, compared to 15% in medium neighborhoods, and 12% in 'wet' neighborhoods; and, for the 'dry' regions, the figures were 11%, 4%, and 0%, respectively. Although in the rural areas there are fewer drinkers overall, the percentage of heavy drinkers is highest in 'dry' neighborhoods. The implication here is that drinkers are at odds with their milieu, and that more of the drinkers in dry neighborhoods are likely to be heavy drinkers. It may be more difficult to get a drink in a dry neighborhood and less acceptable to drink in public, which might encourage people to buy and consume alcohol in excess whenever they have the opportunity. This lack of fit between the local context and individual drinking practices may have serious implications for the prevalence of problem drinking. In other words, *where* one drinks may be as important as *how much* one drinks.

Thinking 'Dry' and Drinking 'Wet'

It may seem unusual to outside observers that 'explosive' and 'binge' drinking are regular occurrences in abstaining milieus, but there are always opportunities for those who want to drink. As one study of drinking practices among adolescents in Mississippi noted:

> *They drink in a secretive manner. A significant number imbibe without the control of normal propriety and are exhibiting several personal and social complications as a result (Globetti 1978:166).*

In general there are fewer drinkers in a dry locality, but the proportion of all drinkers who drink excessively may be high — as one person in Globetti's study remarked: "We drink wet but we think dry." Cahalan and Room's (1974) data show that there are more 'very heavy' and 'steady' drinkers in 'wet' neighborhoods than 'dry', but as a proportion of all drinkers, there are as many 'very heavy' drinkers in the 'dry' as in the 'wet' neighborhoods (16%; see Table 16). A look at the drinking patterns in cities compared to towns and rural areas shows that in absolute terms 'very heavy' drinking is more common in cities, regardless of the region's 'wetness'. However, 'very heavy' drinking as a percentage of all drinking is significantly higher in the cities and towns of 'dry' regions — 22% and 11% as compared to 15% and 7% in the 'wet' regions. One final observation is that the ratio of 'very heavy' to 'steady' drinkers is substantially higher in the rural areas of 'dry' regions when compared to 'wet' regions (9:17).

TABLE 15 DRINKING LEVELS BY NEIGHBORHOOD DRYNESS, REGION, AND URBANIZATION[a] (percentages)

Neighborhood and Drinking Level	Wet Regions			Dry Regions		
	City	Town	Rural	City	Town	Rural
DRY NEIGHBORHOODS	(n=0)	(n=11)	(n=39)	(n=25)	(n=47)	(n=123)
Abstainers	0	(3)[c]	36	40	45	44
Moderate Drinkers	0	(7)[c]	46	48	51	45
Heavy Drinkers	0	(1)[c]	18	12	4	11
MEDIUM NEIGHBORHOODS	(n=173)	(n=153)	(n=74)	(n=80)	(n=136)	(n=67)
Abstainers	14	8	7	10	16	22
Moderate Drinkers	61	69	78	64	78	73
Heavy Drinkers	24	23	15	26	6	4
WET NEIGHBORHOODS	(n=335)	(n=106)	(n=17)	(n=79)	(n=89)	(n=0)
Abstainers	5	8	6	10	8	0
Moderate Drinkers	65	76	82	51	64	0
Heavy Drinkers	30	15	12	39	28	0

[a]Cities = 50,000 plus; towns = 2,500-49,999; rural = rural areas under 2,500.
[b]'Dry' neighborhoods are respondent clusters where more than 50% are abstainers; 'wet' neighborhoods where at least 34% are heavy drinkers.
[c]Not percentaged because of low N.
Source: Cahalan and Room 1974:165. Reprinted by permission from Journal of Studies on Alcohol, Inc.

TABLE 16 VERY HEAVY AND STEADY DRINKERS BY NEIGHBORHOOD DRYNESS, REGION, AND URBANIZATION (percentages)

Drinking Category	Neighborhood Dryness			Region and Urbanization					
				Wet Regions			Dry Regions		
	Wet	Medium	Dry	City	Town	Rural	City	Town	Rural
	Percent of Total Sample								
	(144)	(405)	(129)	(355)	(145)	(70)	(139)	(174)	(95)
Very Heavy	15	7	8	13	6	4	20	9	5
Steady	29	19	8	27	16	14	24	15	9
	Percent of Drinkers								
	(414)	(347)	(64)	(320)	(131)	(58)	(121)	(142)	(53)
Very Heavy	16	8	16	15	7	5	22	11	9
Steady	27	22	16	30	18	17	26	18	17

Source: Cahalan and Room 1974:174. Numbers in parentheses indicate sample size. Reprinted by permission from Journal of Studies on Alcohol, Inc.

These data support an 'inoculation' theory of drinking, which suggests that excessive or 'binge' drinking might be reduced if the local norms pertaining to drinking were more liberal. In other words, if people were able to drink in a more 'normal' and leisurely fashion, the tendency to drink in bursts might be lessened. The abstaining milieu might also provide a 'breeding' ground for 'very heavy' drinking by forcing drinkers to bunch their drinking to offset the overall lack of availability.

Looking now at the relationship between an abstaining milieu and the prevalence of problem drinking, the survey data also suggest higher rates of problems in 'dry' neighborhoods, cities, and regions (Table 17). In other words, 'very heavy' drinkers are more likely to encounter serious problems if they live in 'dry' environments, which suggests that more of the heavy drinkers in the 'wet' environments are able to maintain a high level of consumption without problems. Cahalan and Room (1974) noted that individual differences could not adequately account for the discrepancy in problem rates in 'dry' as opposed to 'wet' environments. The most likely explanation, they argued, was a situational 'lack of fit' between 'wet' individuals and the 'dry' localities in which they live.

The effect of interaction between an individual's inclinations about drinking and the relative wetness of his neighborhood is illustrated in Figure 8. The individual's 'wetness' is assessed by his or her scores on two behavioral measures and two additudinal measures; and the neighborhood's 'wetness' is defined by the aggregate scores on the same measures. The ratio of drink-related problems to heavy drinking is substantially higher on all four measures in the wet individual/dry neighborhood setting than the wet/wet setting. It is important to point out that the label 'dry' in this example does not necessarily imply an abstainer; it simply suggests that an individual, by background and attitudinal characteristics, has a 'dry' sentiment. The indication from Cahalan and Room's data is that individuals who are positively disposed toward drinking are more likely to encounter serious alcohol-related problems if they drink heavily in a predominantly dry environment. In other words, it appears there is not a direct relationship between the quantity of alcohol consumed and the prevalence of problem drinking. This suggests again that it is not necessarily how much is drunk, but *where* is it drunk, that determines the prevalence of alcohol-related problems.

TABLE 17 HEAVY INTAKE AND PROBLEM DRINKING BY NEIGHBORHOOD DRYNESS, REGION, AND URBANIZATION

Percent of heaviest drinkers who experience:	Neighborhood Dryness			Region and Urbanization					
				Wet Regions			Dry Regions		
	Wet (169)	Medium (118)	Dry (26)	City (137)	Town (50)	Rural (20)	City (44)	Town (33)	Rural (17)
Severe Problems	13	8	27	12	8	5	20	6	29
Moderate Problems	28	19	62	26	14	40	38	24	41

Source: Cahalan and Room 1974:178. Numbers in parentheses indicate sample size. Reprinted by permission from Journal of Studies on Alcohol, Inc.

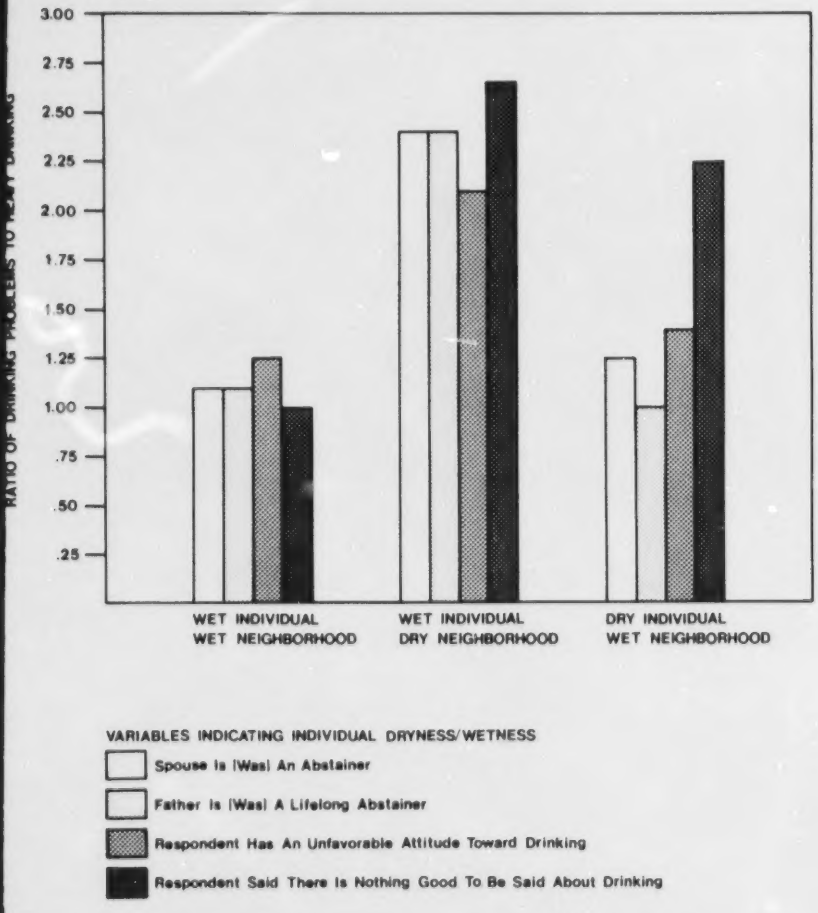

FIGURE 8 INDIVIDUAL AND NEIGHBORHOOD IN DRINKING SENTIMENTS (Adapted from data provided in Cahalan and Room 1974).

4

Prevention and Control of Alcohol Abuse

The 'liquor question' was once at the center of American politics, but in recent years it has been an issue about which most politicians prefer to remain quiet. As Room (1978:270) has observed:

> *The 'liquor question' may now generate less political heat, the temperance movement may be a shadow of its former self, but the prudent legislator knows there is a large reservoir of sentiment, both dry and wet, in the voting population, so that he will generally lose the least votes by doing nothing.*

In most states the Alcohol Beverage Control (ABC) laws have changed little since the repeal of Prohibition, and the laws are viewed mainly as a way to regulate industrial activity and generate government revenues. Very little formal political pressure has been brought to bear on state legislatures to change the laws as a way to prevent alcohol abuses. It is significant, in fact, that the only well-organized advocacy groups in the alcohol field have been those that are industry-based, supporting the idea of 'regulated maximum availability' (Medicine in the Public Interest 1979).

In the early 1980s, an optimistic onlooker might detect the winds of change starting to blow gently. Although no national movement is underway, in many states citizen groups are lobbying for stronger action to be taken against drunken drivers. Other forces claiming that the 'problem' of alcohol is more than just a medical or psychological problem have also been arguing for legal and political solutions to the alcohol problem. It is important to note, however, that these opinions are still confined largely to the professional alcohol-related literature (see, for examples, Bruun *et al.* 1975; Popham *et al.* 1975; Whitehead 1979; Beauchamp 1980). It is perhaps significant that the bulk of the professional opinion that reaches the more popular presses and magazines is in the 'alcohol-is-good-for-you' camp (see, for examples, Chafetz 1976, 1979; Darby 1978). Paradoxically, individuals arguing for public health solutions have at least something in common with the goals of the politically and morally conservative voices that have also made themselves heard in the early 1980s. Perhaps change will be wrought from such an unlikely union — those who seek greater control over alcoholic beverages for moral reasons may be able to reconcile their differences with others who argue that change is essential on medical, social, and economic grounds.

Prevention Policy Options

Although there is considerable debate about the methods that could bring about greater control over alcohol consumption, there is consensus about the need for action of some kind to deal with what, for a significant portion of the population, has become a social problem of major proportions in the United States and many other countires. Until recently, with the domination of the medical and psychiatric professions, the majority of attention has been focused on the treatment of alcoholism and problem drinking. It is now becoming clear that to make significant inroads into the problem (in other words to reduce the overall prevalence of alcoholism), the incidence rate must be reduced by preventing individuals from becoming problem drinkers. Prevention strategies, following the tripartite public health model of alcoholism, could be directed toward *the host*, in education programs and treatment; *the agent*, by limiting the physical and economic availability of alcohol; or *the environment*, by changing the social and cultural context of drinking.

The measures that can be adopted to prevent alcohol abuse are extremely diverse, but the major strategies can be subdivided into three groups (Clayson 1973): (1) *social controls* — which derive largely from the prevailing social attitudes toward drinking; (2) *legislative controls* — which include restrictions imposed by law to bring about changes in the sale and consumption of alcohol; and (3) *fiscal controls* — which involve taxation policies designed to raise revenue or reduce consumption.

Social Availability and Social Control of Heavy Drinking

From a historical perspective, social controls on excessive alcohol consumption have been the most effective way to prevent alcohol abuse, but it has proved difficult to engineer deliberate changes in social control through education and social reforms. In some cultural or ethnic groups the prevalence of problem drinking is surprisingly low. Investigations of these groups show that a mixture of informal social controls exists to prevent individuals from entering the vicious circles of heavy drinking and other forms of abuse (Maloff *et al.* 1979). These controls appear to be traditions that are maintained by a combination of historical inertia and local circumstances. In this regard, research on the drinking practices of American Jews is enlightening. Numerous studies have demonstrated that in relation to the number of Jews who drink alcoholic beverages, the prevalence of alcohol-related problems is extremely low (Snyder 1978; Greeley *et al.* 1980). Glassner and Berg (1980) reported that fewer than one percent of adult Jews are alcoholics or have serious drinking problems. The traditional explanation for Jewish sobriety is that informal social controls prevent many Jews from drinking excessively. Specifically, the culture of Orthodox Judaism prescribes drinking, but requires that it be integrated into familial religious practices. For this reason, many observers predicted that the decline of Orthodoxy during the last two decades will have eroded the social controls on excessive drinking. At the present time, however, there is little hard evidence that alcohol abuse among Jews has increased significantly (Glassner and Berg 1980). A 1980 survey identified four protective social processes that help to explain the low prevalence rates (Glassner and Berg 1980). First, heavy alcohol consumption is perceived by most Jews to be a non-Jewish characteristic. Alcoholism is an 'outgroup' trait; moderate drinking is the norm; and Jews associate themselves with, and many would say, define themselves in terms of sobriety (Snyder 1978). A second protective mechanism is the integration of moderate drinking norms during

childhood by means of religious and secular rituals. It appears that even though Orthodoxy is now less common, Jewish drinking habits that were originally dictated by religious prescription have been extended to secular domains. In other words, the tradition of moderate drinking has been handed down successfully to present-day Jews, even though the religious practices that originally defined drinking practices are significantly less evident. The third social control mechanism is the continual reiteration of moderate drinking by restricting primary relationships to other moderate drinkers. There is substantial evidence that an individual's drinking habits, particularly the quantity and frequency of drinking, are largely determined by the habits of his peers (Skog 1980). Most Jews appear to prefer the company of others who are moderate drinkers. In fact among the survey respondents, most said they did not know anyone who was a heavy drinker (Glassner and Berg 1980). The fourth mechanism includes a repertoire of techniques designed to prevent an individual from drinking more than he or she wants to, even in the face of social pressure to drink more. This amounts to an ability to say 'no' and stick to one's decision.

It is clear that to change attitudes and behaviors among groups who drink more heavily than the Jewish would be a formidable task, one that can only be attempted a little at a time. To date, little evidence exists to demonstrate that educational programs and media campaigns focusing on the 'responsible drinking' theme have been able to change drinking practices significantly (Whitehead 1979). It is slightly surprising, therefore, to find that education still dominates the field of prevention, when legislative and fiscal strategies offer the best, and perhaps the only, hope for making substantial inroads into heavy drinking behaviors (Bruun *et al.* 1975).

Physical Availability and Legislative Controls

As we observed in Chapter 1, a trip across the United States reveals a dazzling (or baffling) array of permutations in Alcohol Beverage Control laws. It is difficult to compare laws in any two states, but one study has quantified inter-state variations in alcohol availability by assigning arbitrary numerical values to each of eight control measures: (1) minimal legal age of purchase; (2) limitations on availability for off-premise sales; (3) limitations on availability for on-premise sales; (4) density of outlets for on-premise purchase; (5) Sunday retail sales on-premise; (6) weekday closing hours for on-premise sales; (7) Sunday retail off-premise sales; and (8) weekday closing hours for off-premise sales (Smart 1980). For each state, the eight items were assigned a score of either 6 (high availability), 4(medium), or 2(low availability), so the total scores could vary from 16 (lowest possible availability) to 48 (highest possible availability). The results shown in Table 18 were mapped in Figure 1 (p. 5). It is no surprise to find that most of the states where alcohol is least available are in the South, the Great Plains, and Utah, although there are some spatial anomalies such as Louisiana (high availability) and Washington (low availability). Using this data, Smart (1980) has shown that availability is related significantly ($p<.01$) to both per capita consumption ($r = 0.41$) and alcoholism rates ($r = 0.42$). Smart noted, however, that income and urbanization were also strongly correlated with both consumption and alcoholism, and when controlling for these two factors he found that availability was unrelated to either. Smart's results imply that policies designed to change alcohol availability are unlikely to bring about the required changes in consumption or alcohol abuse. It is worth noting, however, that any attempt to assess the potential impact of legislative changes by simply comparing spatial variations in existing laws is highly

TABLE 18 CLASSIFICATION OF STATES BY DEGREE OF ALCOHOL AVAILABILITY AND CONTROL

	Degree of Availability (16 = lowest; 48 = highest)				
Control System	High (38-44)		Medium (28-36)		Low (16-26)
Control States[a]	Wyoming[b]	Alabama Idaho Iowa Maine Michigan[c]	Montana New Hampshire Ohio Oregon Pennsylvania	Vermont Virginia W. Virginia[c]	Mississippi N. Carolina Utah Washington
License States	Alaska Arizona Hawaii Louisiana Nebraska Nevada New Jersey New Mexico Rhode Island	Arkansas California Colorado Connecticut D.C. Delaware Georgia Illinois Indiana	Kentucky Maryland Massachusetts Minnesota Missouri New York N. Dakota S. Dakota Tennessee	Texas Wisconsin	Florida Kansas Oklahoma S. Carolina
States with Local Option, with Some Dry Areas	Louisiana[e] New Mexico[e]	Alabama[d] Arkansas[d] Georgia[d]	Kentucky[d] Tennessee[d] Texas[d]	Virginia[e] W. Virginia[e]	Florida[e] Kansas[e] Mississippi[d] N. Carolina[e]

[a] A control state is one that engages in the business of buying and selling alcoholic beverages (state stores).
[b] State control is at the wholesale level only.
[c] Retail sales are conducted at any licensed establishment *and* at state stores.
[d] 15-42% of the state's population is located in dry areas.
[e] 5-10% of the state's population is located in dry areas.
Source: MIPI 1979:8. Reproduced by permission of Medicine in the Public Interest, Inc.

questionable. As Room (1978:289) has observed, . . . "to understand change, one must study change." The availability index is also an extremely crude measure, with all of the items assigned the same scores regardless of their potential impact on availability. Parker and his colleagues (1978) have shown, in fact, that six of the eight items may be redundant, and by defining availability only as the rate of on-premise and off-premise outlets, they found a significant relationship to both consumption and alcoholism rates, at least in the states that do not have per capita restrictions on outlets. Using only the rates of on-premise outlets, Harford and colleagues (1979) also showed that availability is significantly related to alcoholism rates, even controlling for consumption, income, and urbanization. In another study, Watts and Rabow (1981) have shown that the measures of availability and consumption in all of these studies are strongly influenced by interstate travel to buy alcoholic beverages, which may be determined by substantial price variations and/or heavy tourism rates. (This is particularly the case in Nevada, Vermont, New Hampshire, and Washington, DC). According to the Watts and Rabow study, tourism and consumption are significantly correlated ($r = 0.66$, $p. < .01$); and tourism explains more of the variance in consumption than urbanization, income, or availability. The only significant predictor of alcoholism rates appear to be consumption, but even this variable becomes insignificant when Nevada and DC are excluded from the analysis (Table 19).

The general conclusion that we can offer from these studies is that some aspects of availability, especially the spatial variations in the density of on-premise drinking establishments, are related to the consumption of alcohol and the onset of alcohol-related problems. We should note, however, that the results of such studies depend largely on the number of independent variables that are considered, and the choice of data used to measure the different variables.

The most common strategies currently used to manipulate the availability of alcohol include: government control of retail outlets; restrictions on the density of sales outlets; restrictions on the hours and days of sale; and changes in the legal age limit for drinking.

TABLE 19 STANDARDIZED REGRESSION COEFFICIENTS FOR CONSUMPTION AND ALCOHOLISM

Independent Variables	Dependent Variables[a]			
	Consumption		Alcoholism	
	A	B	A	B
Availability	.136	.275	.159	.112
Consumption	-	-	.320[b]	.276
Income	.509[b]	.504[b]	.129	.174
Urbanization	-.071	-.108	.289	.301
Tourism[c]	.555[b]	.372[b]	-	-

[a] A = with Nevada and District of Columbia;
B = without Nevada and District of Columbia.

[b] Significant at $P < .05$.

[c] Tourism was not used as an independent variable to predict alcoholism because it probably would not influence alcoholism rates among state residents.

Source: Watts and Rabow 1981:800. Reprinted by permission from *Journal of Studies on Alcohol*. Copyright by Journal of Studies on Alcohol, Inc.

Government vs. private enterprise. The studies comparing monopoly states with license states show no significant differences in either consumption rates or liver cirrhosis mortality rates, although in all cases consumption is higher in license states (Popham *et al.* 1975). It is clear from Table 18, however, that substantial variations exist in availability among the monopoly states: Wyoming has a score of 42; Michigan, 36; and New Hampshire, 36; compared to scores of 16, 26, and 26 in North Carolina, Mississippi, and Utah. It is possible that in monopoly states where vigorous control measures are emphasized and upheld legally, consumption and problem prevalence rates could be lowered substantially. In Europe, for example, some Scandinavian governments have used their monopoly over alcohol sales to control consumption effectively (Christie 1965).

Hours and days of sale. It has long been assumed that a causal relationship exists between hours of closing and the prevalence of public drunkenness arrests. As Popham and his associates (1975) have shown, however, arrest patterns in Toronto were the same on Sundays, when taverns were closed, as they were on other days. This suggests that the hours of sale may reflect drinking habits, rather than vice versa.

Density and diversity of outlets. The usual explanation of the high prevalence of problem drinking in inner city areas involves the high density of retail outlets (Kane 1981). In general, the available empirical evidence does not support this explanation. In Canada, for example, after the repeal of Prohibition in 1934, the density of outlets was substantially lower than the pre-1916 level; but all of the problem drinking indicators were higher than before Prohibition (Popham *et al.* 1975). There is even some evidence, at least in England, that the rate of on-premise retail outlets is negatively correlated with alcoholism indicators, which supports the argument made in Chapter 3 that problem drinking is often more prevalent in areas where alcohol is less available. This relationship may be explained partly by the existence of more tolerant attitudes toward alcohol consumption and public drunkenness in areas where alcohol is easily available (MIPI 1979).

The overall conclusion that can be reached from the literature in this field is that small-scale changes in availability are unlikely to make significant inroads into either consumption practices or the prevalence of problem drinking (MIPI 1979; Smart 1980). Large-scale changes, on the other hand, may seriously alter consumption — as was noted when grocery stores in some states were first permitted to sell wine — sales rose 175% in Idaho, 305% in Maine, and 130% in Washington during the first year (Hammon 1975). Perhaps the most famous examples of a dramatic shift from 'wet' to 'dry' occurred in Finland (Kuusi 1957). The Finnish government commissioned a study of the likely impacts of its decision to allow retail alcohol sales in rural areas. Beer and wine shops were opened in some towns but not in others. Although consumption increased significantly, the rates of drunkenness did not, perhaps because the use of illicit spirits was reduced. Another example of a large-scale change in availability was Prohibition in the United States. Although the general perception is that Prohibition failed abysmally, as a control strategy it was extremely successful in reducing the prevalence of problem drinking, especially of liver cirrhosis (Jolliffe and Jellinek 1941).

Changing the legal age for consumption. Recent research has shown that lowering the age for the legal purchase of alcohol has produced a significant increase in traffic casualties among teenagers. Douglass and Freedman (1977), for example, estimated that between 1972 and 1975 lowering the legal age limit in Michigan from 21 to 18 years was responsible for at least 4,625 alcohol-related accidents, 89 of them

involving deaths. Similar results have been reported for Ontario (Whitehead *et al.* 1975) and for other parts of the United States (Wechsler 1980).

It has also been evident that lowering the drinking age has resulted in significant consumption increases among teenagers. These increases appear to be a result of increases among those teenagers who already drank before the law changed and drinking among teenagers who were previously abstainers, but whose consumption was encouraged by the change in law (Wechsler 1980). In a survey comparing high school students, Maisto and Rachal (1980) found that students living in states where the legal age was 21 years were much more likely to describe themselves as abstainers or infrequent drinkers than in states where the age limit had been lowered to 18. In addition:

> *. . . higher drinking-age laws were related to less peer approval of drinking and less perceived peer drinking, less drinking and driving, less accessibility to alcoholic beverages, and less frequent intoxication (Maisto and Rachal 1980:174).*

This research casts considerable doubt on the widespread view that changes in the law will not influence the behavior of individuals who have chosen to abstain. The studies show convincingly that a higher minimum age level for drinking will, at the very least, have a restraining influence on some teenagers.

Economic Availability and the Price of Alcoholic Beverages.

Most of the available evidence suggests that price increases, if they are large enough, will alter drinking patterns (Maynard and Keenan 1981). The best-known example of the effect of price on alcohol consumption is the Danish experience with raising the price of akvavit in 1918 (Bruun 1971). The price of a liter was raised from 0.90 to 11.00 Danish Crowns, and the per capita consumption fell to about one-fifth of its previous level. Cirrhosis mortality rates and the prevalence of alcohol abuse fell sharply; Denmark subsequently became a nation of beer drinkers, because the price of beer had not changed.

Extensive studies conducted by the staff of the Addiction Research Foundation in Toronto have indicated that in most countries the price of alcholic beverages, relative to income, is inversely related to consumption. In general, higher consumption levels are associated with greater prevalence of alcohol-related problems (Table 20). In New Zealand between 1960 and 1978 the overall consumer price index rose from 100 to 342, but for alcoholic beverages the increase was only from 100 to 276. During this period, per capita alcohol consumption rose from 5.5 to 8.8 liters *(New Zealand Medical Journal* 1979). As the data in Table 20 indicate, the relationship between price, consumption, and mortality rates is not perfect. In the Netherlands, consumption is low even though the relative price is low, which can be explained in part by the low level of consumption among the rural Calvinists in the northern regions. On the other hand, in no countries are consumption and mortality rates high in the presence of a high relative price. In the United Kingdom and Ireland, for example, alcoholism rates are low in comparison to most other countries; in fact, in the United Kingdom it has been noted that the prevalence of liver cirrhosis is 'a rich man's disease,' perhaps as the result of the relatively high price of alcohol (Terris 1967). The comparison with the United States is striking (Table 21).

TABLE 20 COST OF BEVERAGE ALCOHOL, CONSUMPTION, AND THE PREVALENCE OF LIVER CIRRHOSIS, 1966-1967

Country	Consumption (Liters of Absolute Alcohol)	Relative Price[a]	Deaths from Liver Cirrhosis (per 100,000 > 20 yrs.)
France	24.66	0.016	51.7
Italy	18.00	0.027	30.5
Portugal	17.57	0.023	48.0
Austria	14.47	0.025	38.5
W. Germany	13.63	0.026	29.0
Australia	10.71	0.029	7.8
Czechoslovakia	10.27	0.080	14.8
Canada	8.95	0.029	11.6
Belgium	8.42	0.022	14.2
United Kingdom	7.66	0.057	4.1
Rep. Ireland	7.64	0.092	5.0
Denmark	7.50	0.069	11.6
Netherlands	6.19	0.028	5.7
Finland	4.16	0.117	5.4

[a] The cost of 10 liters of absolute alcohol in the least expensive beverage, divided by personal disposable income.

Source: Popham, Schmidt, and de Lint 1975:133. Included by permission of *British Journal of Addiction*.

Based on this type of data, researchers have argued that alcoholic beverages should be taxed so as to maintain a fairly constant relationship between price and the level of disposable income (Bruun *et al.* 1975). It is also evident, that to overcome demand inelasticity, price increases need to be substantial if reducing consumption is the major goal. Seeley (1960) estimated that a threefold price increase would be needed in Canada before consumption would be reduced significantly. Popham and his colleagues (1975) have suggested that prices should be determined by spatial variations in liver cirrhosis mortality rates, which would allow lower prices in a particular region if and only if the prevalence of problem drinking were lowered. Another possible way to determine the level at which alcoholic beverages should be taxed is to consider their price and income elasticities. As a number of studies have demonstrated, income elasticity is highest for wine and lowest for beer (Table 22). This implies that beer is considered to be more of a necessity by most drinkers; and, as real incomes fall, they will not reduce their beer consumption proportionately. As real incomes rise, wine consumption, and to a lesser extent, spirits, would increase significantly. From this perspective, it appears that to reduce the consumption of wine and spirits it would be necessary to raise their prices over and above the rate of increase in real income. The price elasticities of spirits and wine are also very different from that for beer, which appears to be insensitive to price changes. In other words, raising the price of beer would be an effective way to raise revenue, but it would not result in lower consumption. Raising the price of wine and spirits, on the other hand, would reduce consumption (see also Ornstein 1980; Cook 1981).

Popham's team has argued against a differential taxation system, especially one in which spirits would be taxed at a higher level, because they are thought to be more intoxicating per unit of price. From their research data they argue that there are no

TABLE 21 STANDARDIZED MORTALITY RATIOS[a] FOR LIVER CIRRHOSIS BY SOCIAL CLASS, U.S. (1950) AND ENGLAND AND WALES (1949-1953)

	United States (Men, 20-64 yrs.)			England and Wales (Men, 20-64 yrs.)	
I	Professional Workers	90	I	Professional Occupations	207
II	Technical, Administrative, and Managerial Workers	88	II	Intermediate Occupations	152
III	Clerical, Sales, and Skilled Workers	105	III	Skilled Occupations	84
IV	Semi-Skilled Workers	118	IV	Partly-Skilled Occupations	70
V	Laborers (non-farm)	148	V	Unskilled Occupations	96
	Agricultural Workers	51			

[a]Standardized mortality ratios compare the tabulated number of deaths in an occupation group with the number to be expected if the age specific death rates from the same cause (cirrhosis) for the total male population of working age had prevailed in that occupation group. 100 = overall average rate.

Source: Terris 1917:2081. Included by permission of *American Journal of Public Health*.

significant differences in the intoxication effects of beer, wine, and spirits. In our own empirical work we have been able to offer further insight into this issue. We have been particularly concerned, for example, with the effect of changing patterns of alcohol consumption and the prevalence of alcohol abuse in the United States. In Chapter 2 we described our research on the changing structure of beverage preferences during the 1970s. In one part of our analysis we identified two substitution factors, one pinpointing states where the overall market share of spirits had increased at the expense of beer (or vice versa), and another showing which states had experienced a substantial increase in wine consumption at the expense of beer (and vice versa). From the scores on these two factors we were able to identify six groups of states: 1) where beer was a substitute for both wine and spirits; 2) where beer was a substitute for spirits; 3) where beer was a substitute for wine; 4) where wine consumption increased (often at the expense of beer); 5) where spirits were substitutes for beer; and 6) where spirits were substituted for beer and wine. If different alcoholic beverages have differentially damaging effects, we would expect to find significant differences in the alcoholism and mortality rates in each of the six groups of states. Specifically, we would expect the states where beer had been substituted for spirits and wine to have the lowest prevalence rates; states where spirits had substituted for beer and wine should have the highest prevalence rates; and states where more wine had been consumed should be intermediate. One of the problems we encounter here is the lack of recent alcohol-related mortality data, so for this analysis we have had to use a number of problem indicators that might not

TABLE 22 INCOME AND PRICE ELASTICITIES OF ALCOHOLIC BEVERAGES

Beverages	Income Elasticity			Price Elasticity		
	Canada[a]	UK[b]	Canada[c]	Canada[a]	UK[b]	Canada[c]
Spirits	0.7	2.2	1.0	-1.4	-1.6	-0.9
Wine	1.4	2.5	2.5	-1.7	-1.1	-0.8
Beer	0.2	0.7	1.0	-0.1	-0.2	0.0

[a]Source: Lau 1975:242.
[b]Source: Central Statistical Office 1980; see Holterman and Burchell (1981).
[c]Source: Duffy 1980.

reflect the full impact of the changes in consumption patterns up to 1978. As the results in Table 23 suggest, the hypothesis is not supported, especially for the states where spirits have been substituted for beer and wine (groups 5 and 6). In fact the data show that the prevalence of most alcohol-related problems tend to be slightly higher in states where beer was a substitute for spirits, and the highest prevalence occurred in the states where wine consumption had increased substantially during the 1970s. This suggests that health problems are more likely to occur when drinking preferences shift toward wine, rather than toward beer or spirits. Combining our conclusion here with the evidence on the price and income elasticities, we might suggest tentatively that if differential taxation policies are to be adopted, we should pay particularly close attention to the price of wine and spirits (see Cook and Tauchen 1981). At this stage such a conclusion is premature, but we consider the topic to be worthy of further investigation.

In recent years substantial efforts have been made to change the pricing structure of alcoholic beverages. In the United Kingdom, for example, a proposal has been made to raise taxes substantially to offset recent increases in real incomes. The evidence supporting such a move shows that over a twenty-year period the amount of work needed by a manual worker to earn the price of a pint of beer fell from 23 minutes in 1961 to 12 minutes in 1981. For spirits, the fall was from 6 hours to 2 hours per bottle. It is not surprising to find stiff opposition to substantial tax increases, particularly from the beverage industry. Their arguments include for example, that unlike smoking, many people are able to drink moderate amounts of alcohol without harm, and these individuals would be penalized by a tax increase. The burden would also fall most heavily on the lower socio-economic groups, for whom drinking is the major activity outside the home. As in the United States, there are relatively few permanent and loudly vocal lobby groups in favor of reforming alcohol control policies. The major obstacle to economic reform is the opposition of the vested interest groups, which have powerful allies in many government departments, including industry, trade, and the Treasury. In the United Kingdom 700,000 people are employed directly in the manufacturing, distributing, and sale of alcohol. Alcohol beverage taxes raise more than £2,500 million each year, which amounts to about 16% of the total excise taxes.

In addition to the practical problems associated with a reform of alcohol control policies, there is a lack of consensus about the potential impact of such policies as taxation increases. As we noted earlier, opponents of the distribution of consumption model have argued that most heavy drinkers and alcoholics would not be affected, even by substantial price increases, which would simply encourage the heavy consumers to eat less, switch to non-beverage alcohols, or resort to a life of crime to raise more funds for drink. Popham and colleagues (1975) discounted this argument on the basis of liver cirrhosis mortality data, which is a major indicator of alcoholism. The data show that deaths decline with price increases, so presumably the behavior of heavy drinkers and alcoholics is responsive to changes in price. They also point out, rather callously, that as the major goal of prevention is to reduce incidence rates (new cases of alcoholism), policy changes need to be directed toward moderate drinkers — implying that we might as well give up completely on the heavy drinkers.

Theories of Prevention and Control

As we have seen in the previous discussion, it is extremely difficult to evaluate the potential impacts of different attempts to prevent or reduce the prevalence of alcoholism. There is no shortage of research on the subject, but in most cases changes in

alcohol policy are determined by a combination of economic need, or greed, and political expediency. In ideal circumstances, we would like to think that policies are influenced by the type of thinking that currently dominates the alcohol field (Frankel and Whitehead 1981). As we observed in Chapter 1, this thinking changes over time. With changes in public and professional opinions about alcohol use and abuse have come different control strategies. As we shall see, however, for a number of reasons alcohol policy continues to be dominated by the medical model of alcoholism, in spite of some compelling alternatives.

The Medical Model

The ascendancy of the medical model within the ranks of alcoholism professionals helps to explain why the bulk of existing prevention strategies falls into the category of *tertiary* prevention. Attempts are made to encourage people with drinking problems to enter recognized treatment programs, including Alcoholics Anonymous. Most professionals feel that participation in a treatment program *and* regular attendance at AA meetings is essential. It is interesting to note, in fact, that although the majority of the public now tend to accept that alcoholism is a disease rather than a moral failing or a criminal activity, most people still see AA as the only valid and acceptable form of treatment. Because of its non-professional, self-help characteristics, AA is significantly different from medical or psychiatric treatment. This paradox in opinion — thinking of alcoholism as a medical problem but one that has a non-medical solution — has encouraged one observer recently to describe alcoholism as a 'folk-disease' (Rodin 1981).

The medical view assumes bi-modality in the drinking population, with the alcoholics clearly differentiated from the majority of 'normal' drinkers (Figure 9). This perspective gives a degree of inevitability to alcoholism and problem drinking, because it assumes that a fixed proportion of the population is destined to be chronic, irreversible, and incorrigible drinkers, for whom the only available options are abstention and treatment. According to the medical model alcoholics will always find a way to drink, so it seems pointless to try to alter the social and environmental correlates of heavy drinking. Addicts will find their drug regardless of how expensive or difficult to obtain it becomes. If they have to, they will switch to beverages with a higher alcohol content per dollar, for example, from beer to cheap wines and spirits, or even to non-beverage alcohols. Following this line of reasoning, we should not be surprised to find that prevention is often limited to rather weak educational programs, mostly directed towards school children. Although we would not suggest that such programs be suspended, there is little evidence that they have had much success in stemming the rising tide of alcohol consumption among the nation's youth.

A Social Opportunities Model

To divert attention away from the physical and psychological roots of the alcoholism issue, some experts have argued that the individual and group life circumstances of potential alcohol abusers are important etiological variables (Cahalan 1970). Jessor and Jessor (1980), for example, have argued that limited access to opportunities — jobs, education, status, social acceptance, family integration, and adequate housing — is a major source of pressure that can squeeze individuals into

TABLE 23 MEAN ALCOHOLISM INDICATOR RATES AND CHANGING CONSUMPTION PATTERNS, 1970-1978

Groups	Alcoholics per 100,000 (1975 Jellinek estimates)[a]	ACCI Index[b] (1977) (includes D.C.)	Liver Cirrhosis Deaths[c] (1975-77)	Liver Cirrhosis Deaths[d] (1978)
GROUP 1 — *Beer was a substitute for both wine and spirits* Florida, Missouri, Alabama, New Mexico, California, Georgia, Oklahoma, S. Carolina	53.1	.62	19.6	12.6
GROUP 2 — *Beer was a substitute for spirits* Washington, DC, Alaska, Delaware, N. Carolina, Tennessee, Connecticut, Massachusetts, Nebraska, Illinois, New Jersey, New York	55.9 (69.1 including DC)	.98 (.98 including DC)	21.4	12.7 (15.4 including DC)
GROUP 3 — *Beer was a substitute for wine* Arkansas, Louisiana, Mississippi, Texas, Utah, West Virginia, Arizona	48.3	1.02	15.9	10.3
GROUP 4 — *Wine Consumption Increased* Washington, DC, New Hampshire, Connecticut, Massachusetts, Minnesota, New Jersey, Rhode Island, Vermont, New York	57.9 (73.8 including DC)	1.08 (1.07 including DC)	22.1	10.2 (13.8 including DC)

Groups	Alcoholics per 100,000 (1975 Jellinek estimates)	ACCI Index (1977) (includes D.C.)	Liver Cirrhosis Deaths (1975-77)	Liver Cirrhosis Deaths (1978)
GROUP 5 — *Spirits were a substitute for beer* Indiana, Louisiana, Michigan, N. Dakota, Oregon, West Virginia, Wisconsin, Nevada, Arkansas, Colorado, S. Dakota, Texas, Washington	49.4	1.02	17.7	12.1
GROUP 6 — *Spirits were a substitute for beer and wine* Maine, Maryland, Nebraska, Montana, Hawaii, Idaho, Colorado	43.5	1.01	16.5	10.3

[a] Source: Coakley, *et al* 1978.

[b] Source: ACCi index scores; see Malin *et al.* 1978.

[c] Crude mortality rate per 100,000 population aged 15-74 averaged over the 1975-1977 period. Source: NIAAA 1981 (NCHS data). Excludes Washington, DC; data not available.

[d] Age-adjusted death rates per 100,000 for cirrhosis of the liver, as defined by ICDA, Code 571. Source: National Center for Health Statistics public use micro-data tapes. The age adjusted prevalence rates are substantially lower than the crude rates, because liver cirrhosis mortality is more prevalent among older individuals.

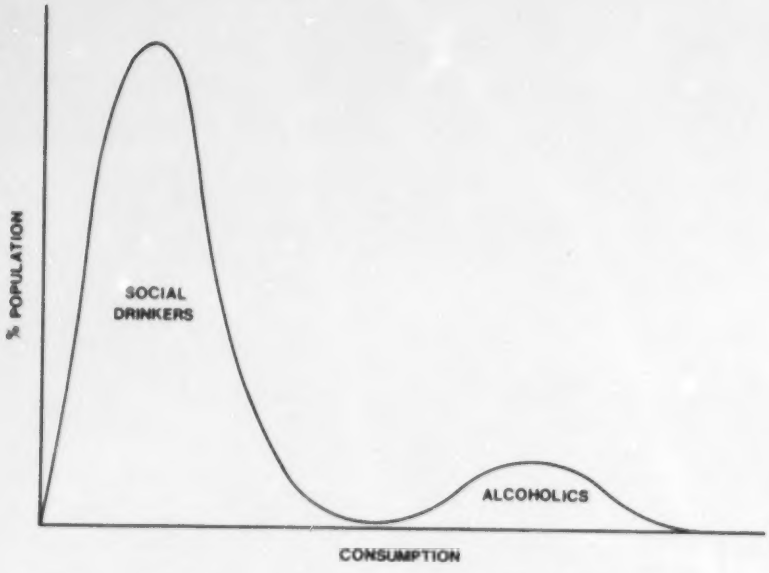

FIGURE 9 THE MEDICAL MODEL OF ALCOHOLISM

patterns of excessive alcohol use. Lack of access to these opportunities substantially weakens the formal and informal social controls that normally operate at the peer, family, and community levels to limit alcohol consumption. Thus in disadvantaged areas we often find norms of heavy drinking, and a certain disregard for the prevailing Alcoholic Beverage Control laws. The Jessors (1980:42) argued that as the pressures of social and economic hardship build up, individuals are less likely to feel under any obligation to behave according to community-wide norms. In their words, the greater the pressure:

> *. . .the less the stake a person or group would have in the social order and the greater the attenuation of normative and social controls . . . the prevention implication of such a conceptualization is quite clear – it points to increasing access to opportunity as a way of lessening pressure to alcohol abuse.*

In principle, most observers would probably agree with this reasoning. For inner city blacks, for example, Kane (1981) suggested a number of etiological explanations for the excessive prevalence of heavy and problem drinking in many communities. Kane argued that in the black community attitudes toward alcohol have historically been ambivalent, leaving individuals with no clear messages about what are acceptable drinking practices. Kane observed that alcohol is also more easily available in black communities, so the combination of loose social controls (availability), ambivalent normative prescriptions about drinking, and the lack of access to normal social and economic opportunities could help to produce a pattern of serious problem drinking.

Although the Jessors' model fits quite well with the reality of the black community, it is more difficult to accept their rather simplistic and optimistic reasoning about its prevention. It is not surprising, therefore, to find that two other approaches, both offering more specific prescriptions for policy, currently dominate theoretical thinking in the area of prevention: the social integration model and the distribution of consumption model.

The Social Integration Model

As we noted earlier, this model has been referred to as an 'inoculation' theory of alcohol abuse, because it implies that heavy and damaging drinking can be reduced by increasing the prevalence of moderate or 'responsible' drinking (Whitehead 1979). The hope is that at least some alcohol-related problems will be reduced if drinking becomes more fully integrated into the prevailing culture, less of a 'forbidden fruit.' As we have just mentioned, urban blacks offer an example of a group among whom attitudes toward drinking are ambiguous and highly polarized. This has been partly a result of the 'mixed signals' blacks have received from the white majority, who at some times have encouraged heavy drinking, but at other times have expected and demanded sobriety (Harper 1976). The response among blacks has been a now familiar pattern of high abstention rates *and* high problem drinking rates in the same community.

The social integration model makes sense intuitively, but it may prove difficult to implement. The risks involved with increasing the overall availability of alcohol are considerable, but they have not inhibited the optimistic (or the greedy) from making extravagant claims. After Prohibition, for example, the United Brewers Industrial Foundation sponsored advertisements in popular magazines describing beer as the 'bulwark of moderation,' implying that by drinking more beer society could inoculate itself against the perils of alcohol abuse. . . .

> *Beer is one of the oldest and best of beverages, its use is widespread in every land; it is within the reach of every purse. . . . The growth of its use in this country is bound to make for general temperance; for there is nothing more promising to combat the evil of too much alcohol than the opportunity of drinking good beer (Wisconsin Department of Health and Social Services 1979:12).*

Obviously nothing is quite this simple, and it is rather naive to suggest that beer is *not* alcohol! It is also overly optimistic to expect that, by changing the patterns of availability, community attitudes will automatically improve to bring about effective social controls on the use of alcohol. This reasoning prevailed in the United Kingdom against strong arguments for liberalizing licensing hours in the early 1970s. The argument, which was backed up by a Home Department report (U.K. 1972), was based on the belief that longer opening hours would help to make drinking a less clandestine affair. Opponents argued that attitudes, and thus habits, would not change easily, and that drinkers would temporarily bask in the new-found availability, with serious consequences for the prevalence of problem drinking.

Proponents of the social integration model argue that 'responsible' drinking will be inevitable once drinking becomes just one of many acceptable aspects of ordinary social exchange, rather than an activity in itself. As evidence for this position, it has been demonstrated repeatedly that heavy consumption is much more likely in settings where the focus is exclusively on drinking (taverns and bars), than where drinking is just one of a number of activities, including entertainment, dancing, and eating (MIPI 1979).

This 'laissez-faire' attitude toward alcohol control is particularly popular with those individuals who believe that the existing laws are ineffective as ways to control consumption. Making alcohol more generally and easily available would, they argue, also help to reduce much of the flagrant law-breaking that occurs daily as consumers and suppliers attempt to bend the existing laws. Naturally this position is favored by the alcoholic beverage industry, because overall consumption could increase if there were a convergence toward a 'responsible' mean level of drinking.

At the present time, little evidence exists to support the social integration model. Jessor and Jessor (1980:39) have argued that the theory is too 'parochial', in that it assumes a too-simple relationship between public norms and individual drinking behavior. As they write:

> *the issue is not simply the content of the norms but* the factors that influence the hold norms have *over conduct. . . . (These) . . . will vary with the nature and the effective operation of social controls and sanctions for normative departures; with the degree to which there is unimpeded access to alcohol; with the consonance of drinking norms with norms in other areas of alcohol-related behavior such as sex, aggression, and drug use; with the degree to which there is pervasive consensus versus anomie in the larger structure of norms about social behavior in general; with the degree to which there is a stake in normative adherence via access to societal opportunity; and with individual differences in personal controls . . .* [*authors' emphasis*].

It is also likely that the social integration model would require too great a change in the cultural practices that have evolved slowly over the years. The British, for example, felt it was unrealistic to expect drinkers to become 'continental' in their habits overnight, which accounts for the demise of the Errol Report (U.K. 1972). Perhaps the most damning criticism of the social integration model is the empirical evidence of alcohol-related problems in some of the countries where drinking is well-integrated into everyday life, including France, Italy, and other Mediterranean countries. Slow, steady, and regular drinking may help to reduce some of the more visible drinking problems, like public drunkenness; but there is clear evidence that in these countries the prevalence of alcohol-related medical problems, particularly liver cirrhosis, is the highest found anywhere in the world (Schmidt 1977).

The Distribution of Consumption Model

An empirical observation of a relationship between the mean level of consumption within a particular area and the proportion of heavy drinkers suggests a model based on distribution of consumption. For example, a direct relationship between the proportion of heavy drinkers in a population and the prevalence of alcohol-related morbidity and mortality is found (Schmidt 1977). The general consensus is that drinking in excess of 15 centiliters of alcohol per day is extremely hazardous (13½ ounces of whiskey or 100 ounces of beer); but consumption of 10 centiliters per day is also correlated with health problems (Bruun *et al.* 1975).

The distribution of alcohol consumption in most western and industrialized societies has been shown to be more or less lognormal; in other words, the log of consumption is normally distributed. This implies that the majority of the population drinks moderately, a sizeable minority drinks little or nothing, and a minority drinks to

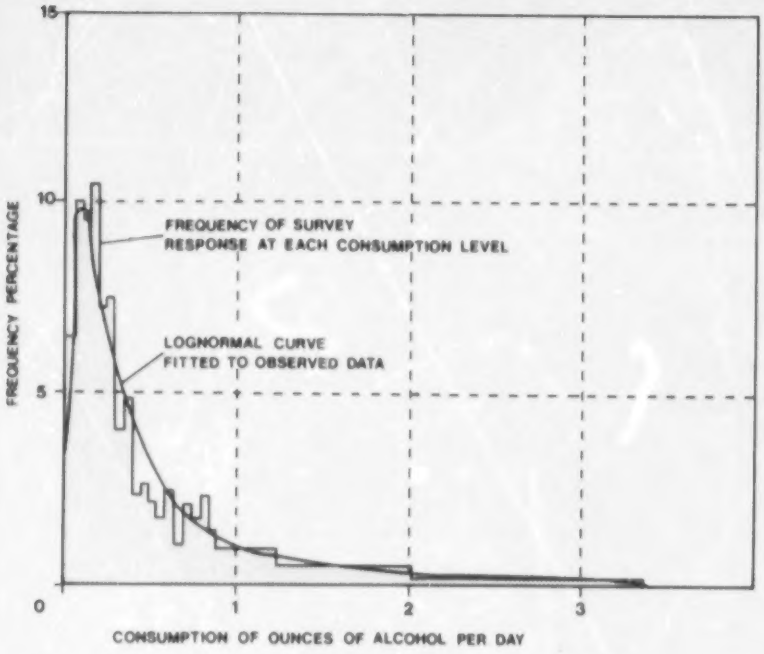

FIGURE 10 THE DISTRIBUTION OF CONSUMPTION MODEL OF ALCOHOLISM (From Mahlin *et al.* 1980).

excess. In Canada, for example, 3% of the drinkers consume more than 15 centiliters per day, whereas 84% drink less than 5 centiliters; and in the United States, 6.5% of the population accounts for half of the total alcohol consumed, which is an average of 8 ounces of alcohol per person per day (Malin *et al.* 1980; Figure 10). The lognormal curve is continuous, unimodal, and positively skewed, and the area under the right-hand tail, indicating the heavy drinkers, increases multiplicatively as the mean level of consumption increases. Thus, for example, if a country has a mean consumption level of 7.5 liters per year, and the distribution of lognormal with a standard deviation of 1, the proportion of heavy drinkers will be approximately 2%. If the mean consumption increases to 15 liters, the proportion of heavy drinkers will increase to about 8% (Skog 1980).

As this example demonstrates, the shape of the lognormal curve, and therefore the proportion of heavy drinkers, depends on the *mean* consumption level and the *dispersion* of the distribution (the standard deviation). After numerous empirical investigations in various regions and countries, it has been demonstrated that dispersion in the distribution of consumption varies very little (Bruun *et al.* 1975). In other words, there is a constant relationship between mean consumption level and proportion of heavy drinkers. This implies that as per capita consumption increases, the prevalence of heavy drinking, and therefore problem drinking, increases geometrically (the rate of

heavy drinking will on average be proportional to the square of the rate of increase in per capita consumption). At the present time there are no generally acceptable theoretical explanations of this phenomenon, which appears to transcend national boundaries, cultural groups, and beverage preferences. Some researchers have argued that the explanation is partly statistical and partly sociological. For example, Skog (1980) has observed that the so-called 'law of proportionate effects' accounts for at least part of the 'snowballing' increase of heavy drinkers. As the mean consumption level increases, individuals at each level in the drinking hierarchy consume more alcohol, with the heavy drinkers drinking proportionately more than others. As we observed in Chapter 2, it is also possible that the phenomenon of heavier drinking diffuses through the population, either from person to person (social interaction), or as a result of the increased presence and visibility of alcohol in almost all social situations (Sulkunen 1976).

In public health terms, the distribution of consumption model implies that an obvious solution to the rising problem of alcohol abuse is to reduce the mean level of alcohol consumption, which would subsequently reduce the prevalence of heavy and problem drinking. Theoretically this can be achieved in a number of ways: increasing prices substantially to curtail sales; reducing availability by tightening the liquor control laws; or banning all advertisements for alcohol.

One of the most frequent criticisms of the distribution of consumption model is that it is purely an empirically validated phenomenon. At the present time no adequate theories have been put forth to explain the constant relationship between mean consumption levels and the proportion of heavy drinkers in so many different locations. Room (1978) has even argued that the assumed causality in the model may be incorrect — in other words, that mean consumption levels may be influenced by the consumption of very heavy drinkers, rather than vice-versa. If this were the case, the high correlations between liver cirrhosis deaths and per capita consumption occur simply because both are surrogates for the same phenomenon, the drinking patterns of heavy drinkers.

As we have seen, there are strengths and weaknesses with all of these theories of alcohol use and abuse. Elsewhere we have described our attempts to create and test simple causal models of each theory using county level data for the state of Oklahoma (Smith and Hanham 1982b). The results were mixed, but we were able to predict most effectively with our versions of the social opportunities and social integration models. In general our results were consistent with the conclusions reached by Colon (1980), who evaluated the distribution of consumption and social integration models using state level data for the United States. Colon used *religion*, *attitudes to drinking*, and *social isolation* as independent variables in the social integration model; and the *price* of alcohol, *income*, and six alcohol *control policies* in the distribution of consumption model. His results showed that the only significant predictors of alcoholism rates were socio/cultural variables representing individual isolation; and, although attitudes to drinking, social control institutions (religion), and income were related to consumption levels, they did not predict alcoholism rates significantly. Colon's study offers limited support for the social realistic models of alcohol abuse would probably resemble our social opportunities model. His results also suggested that alcoholics are influenced by different variables than the socio/cultural and economic restraints that influence non-alcoholics — implying that alcoholic behaviors are qualitatively (and obviously quantitatively) different from those of non-alcoholics — which seems to favor the medical model of alcohol abuse. Colon also noted that the only alcohol policy variable significantly related to alcoholism was the number of on-premise licenses per state, but he

suggested that the alcoholism rate might determine the density of outlets, rather than vice versa. In other words, the availability of alcohol may reflect rather than cause spatial variations in drinking preferences (or patterns). This conclusion is similar to Room's (1978) observation that the behavior of heavy drinkers might be the major determinant of the mean level of consumption and the local prevalence of alcoholism.

Using data for each of the American states, we have also attempted to evaluate the distribution of consumption and social integration models (this analysis is discussed in more detail by Smith 1982b). Our evaluation is intuitive rather than causal in nature, and it focuses on the relationships between changing patterns of alcohol consumption and the prevalence of problem drinking. When we compare alcohol consumption at the state level with alcohol-related mortality, we find higher mortality rates in those states with the highest levels of consumption; but the overall correlation is low ($r = 0.25$), and the relationship is not linear. States with the lowest consumption have a mean mortality rate higher than would be expected from the distribution of consumption model. It is possible, however, to argue that this is consistent with the social integration model. In other words, as we discussed in Chapter 3, it is reasonable to expect high rates of problem drinking in areas that are predominantly 'dry' in their outlook to alcohol (which is obviously correlated with low consumption levels). This hypothesis was supported when we investigated the relationship between mortality rates and alcohol consumption increases from 1970 to 1978. The overall relationship was as expected, but again the correlation is low ($r = 0.23$). It is possible, that in some states the predicted relationship between consumption and mortality can be explained by the distribution of consumption model, whereas in other states the social integration model offers a better explanation. For example, in the states where alcohol consumption increased least during the 1970s, deaths are relatively high because the overall level of consumption is still high (New York, New Jersey, and Delaware). Lower-than-expected mortality rates in the states that experienced the largest increase in consumption are more difficult to interpret. One possibility, in line with the social integration model, is that the residents in these states may have 'learned how to drink', and are therefore less likely to experience the more serious medical problems associated with heavy alcohol consumption.

Following the social integration model we also hypothesized that problem drinking would be more prevalent in areas where the 1978 drinking practices had changed more from the norms prevailing in 1970. In the Northeastern states, for example, the norms have consistently been easy availability and high consumption; but, in the 1970s, consumption was stable in many of these states. In comparison, many Southern and Great Plains states, where consumption has always been low, have experienced substantial increases. Assuming that the degree of change in the consumption level is related to the amount of normative change within a state, we constructed a simple index of change. The results suggested that the highest death rates occurred in states where consumption had increased significantly from a low base level during the 1970s. Although we recognized that this rather simple investigation has some inherent flaws, we feel that it merits a closer look in our on-going research. One line that is worth pursuing is the effect of consumption changes on increases in liver cirrhosis mortality rates during the 1970s. It has been noted by Brenner (1975) that we should expect at least a two-year lag in the effect of any change in consumption on the cirrhosis death rate, because of the clinical course of the disease (see also Terris 1967; Schmidt 1977). In 1982, mortality data are not available past 1978, but in the future we should be able to test the lagged impact of recent consumption changes on the spatial prevalence of liver cirrhosis.

Conclusions

Each of the theories of alcohol use and abuse provide reasonable, if insufficient, explanations of different aspects of problem drinking. The most practical approach seems to be to view the different models as complementary rather than competing (Frankel and Whitehead 1979). In a field as complex as alcoholism, it seems appropriate to search for explanations from a variety of perspectives. Room (1978), for example, has observed that the two major theories actually describe different parts of the alcohol abuse problem — the social integration model considers alcohol-related problems that result from a lack of fit between consumption practices and the local norms regarding drinking, whereas the distribution of consumption model looks at chronic alcohol abuse that is likely to prevail in areas where heavy alcohol consumption is the norm. In other words, one theory may help to explain the prevalence of alcohol problems in 'dry' environments, while the other may offer a better explanation for 'wet' environments, which is more or less the conclusion we reached earlier in this chapter. Extending this line of reasoning, we might add that the two theories could suggest different, but not mutually exclusive, prevention strategies. Clearly what might work in one area might fail miserably somewhere else. Whitehead (1975) has argued that the two models might offer complementary prevention strategies even within the same locality, if, for example, it proved possible to achieve greater integration of drinking practices while at the same time lowering overall consumption levels. One strategy would include changing the laws governing alcohol advertising, to allow only those advertisements that stress moderation or emphasize the immaturity and dangerousness of driving under the influence of alcohol.

We have stressed in this chapter that in addition to the different prevention strategies suggested by alternative theories of alcohol abuse, any radical change in policy will encounter the vast forces of inertia, political expediency, and vested economic interests. As we noted earlier, the most effective alcohol control strategies are probably large-scale reductions in availability, or subsiantial increases in price through taxation. The chances of either strategy seeing the light of day are slim — not because the theories on which they are based have been judged methodologically flawed or theoretically vacuous, but because neither would be politically or economically feasible. The marketplace prevails over alcohol policy to such an extent that real alcohol prices have fallen dramatically in recent years. The federal tax on alcohol has remained constant since 1951, which amounts to a government subsidy of the alcoholic beverage industry (Cook and Tauchen 1981). This policy is consistent with individual and corporate interests in the accumulation of wealth. At the same time, alcohol has provided much-needed government revenues. On the other hand, declining real prices appear to be at odds with the government's commitment to combating alcohol abuse, which was formalized with the creation of the National Institute on Alcohol Abuse and Alcoholism. As Smith (1982a) has argued, however, the paradox is only superficial, because the majority of NIAAA's budget is targeted to alcoholism treatment programs, with only a secondary emphasis on prevention and education (Glaser *et al.* 1978). The concentration on treatment is based firmly on the medical model of alcoholism, according to which alcoholism is an individual disease that affects only a small proportion of all drinkers. The model systematically excludes strategies that would reduce the supply or raise the price of alcohol, because the assumption is that alcoholics are addicts and they will find alcohol at any cost. In other words, it is not a paradox to have a laissez-faire alcohol control policy *and* a sizable investment in alcohol treatment programs. On the

contrary, it is entirely consistent. The decision to drink or not to drink is generally considered to be an individual's responsibility, and any illness resulting from drinking is also an individual affair. Everyone is happy with the laws the way they are. The alcohol industry profits; the government reaps its rewards; individuals are allowed to drink cheaply; and professionals are able to practice their favorite therapies. Unfortunately, in this case, the operation may be a success, but the patient will probably die! Treating existing alcoholics while at the same time helping to create new alcoholics ensures that the 'alcohol problem' will never be solved (Morgan 1979; Gusfield 1982). As we chip away at the prevalence rate, the incidence rate more than compensates, so the pool of alcoholics expands, rapidly becoming a sea of intemperance.

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